TERRITORY OF WESTERN SAMOA

DEPARTMENT OF AGRICULTURE, FORESTS, AND FISHERIES

ANNUAL REPORT

for

1959

waiting for RAM

APIA, WESTERN SAMOA, 29 JANUARY 1960

The Planters' Friend (*Plaesius javanus*)
Drawn by Dr J. HERRING

COMMONWEALTH MYCOLOGICAL INSTITUTE
21 MAR 1960

T H E T A S K

Three public statements recorded during 1959

I

"Samoan people had long had the idea that the land would grow anything planted in it; but are now beginning to realize that better methods of increasing the yield and improving the soil are needed" - Hon. Fiame M.F.M.II, Minister of Agriculture speaking at the meeting of Legislative Assembly with the United Nations Mission, April 1959.

II

"The main problem of agricultural production is to improve the methods of the Samoan farmer and to rehabilitate about 20 per cent of the existing agricultural land which has deteriorated" -. Report of United Nations Mission, May 1959.

III

"Increased agricultural production, better quality bananas and copra, and an increasing awareness among planters of the value of fertilizers and scientific principles of farming, show that the work of the Agriculture Department is slowly getting results" - Editorial, Samoa Bulletin, 13 November 1959.

TERRITORY OF WESTERN SAMOA

DEPARTMENT OF AGRICULTURE,
FORESTS AND FISHERIES

ANNUAL REPORT FOR YEAR 1959

I. INTRODUCTION

a) New Developments:

1. The year 1959 was marked by several important events and by advances, both in the development of agricultural services and also in the total production of the Territory's export crops. As in previous years this report briefly reviews the current trends in the agricultural and related industries, and summarizes the activities of the Department during the period, as recorded in divisional reports prepared by senior officers. The most important of these developments may be summarized as follows:-

a) the introduction of the Agriculture, Forestry and Fisheries Ordinance, - establishing the Department, and confirming its activities and responsibilities;

b) pursuant on the appointment on 1st October of the Hon. Mata'afa M.F.M.II as Prime Minister, the assumption of duty by the Hon. Tualaulelei Mauri as the Minister of Agriculture;

c) the further development of the regional Agricultural College and Farm at Avele;

d) the installation of modern fumigation equipment;

e) the introduction of the Bunchytop Ordinance to support the efforts to control this virus disease of bananas;

f) the demonstration in Samoa for the first time of field control of banana leaf-spot disease;

g) the further development of field and laboratory research services at Nafanua, Vailima and the Entomology laboratory;

h) the increasingly successful control of rhinoceros beetle in the Apia area and the extension of field control and eradication of breeding places to country districts;

i) the commencement of a fertilizer distribution and disease control scheme for banana growers;

j) the erection of two banana sheds in Savai'i.

2. Major items in the Territory's overall agricultural effort included:

a) continued increase in banana production in Savai'i to a record total of 189,000 cases, 37,000 more than that of the previous year;

b) an increase in cocoa production by 160 tons;

c) an increase in copra production by 3,000 tons and a continued improvement in quality (50 per cent H.A.D. and 29 per cent S.D.1.);

d) the construction by the people, of many feeder and plantation roads in Savai'i and Upolu;

e) the expansion of land and sea transport facilities for carriage of bananas and other produce; and

f) the continued high level in overall banana production to the total of 785,950 cases exported.

Policy and Organisation:

3. The overall policy and programme for agricultural services was little changed from that previously approved and as recorded in previous reports. Two important ordinances were proclaimed during the year viz.:

The Agricultural, Forests and Fisheries Ordinance;

The Bunchytop Ordinance

The Agriculture Ordinance confirmed the scope of departmental activities in the important fields of agriculture, fisheries and forests, agricultural education and marketing; but the position regarding livestock industries is still unsatisfactory and no proper provision exists for the control of animal importations, the prevention and treatment of stock diseases or the development of the livestock activities which are essential to a balanced land-use and a healthy agriculture. Proposals for a Livestock Ordinance were considered but not finalized. Late in the year, emergency action was necessary to control the import of poultry carcases from countries where certain serious diseases exist.

4. The United Nations Mission which visited Samoa during March and April endorsed the policy and programme for agricultural development and commended the work of the Department. The Mission recognised that "the future development of Agriculture called for an improvement in the efficiency of the traditional methods of agriculture" and stressed the importance of expanding the extension services and experimental work of the Department and of the plans for Agricultural training at Avele Agricultural College. (1)

The Mission also recommended support of the Department's programme for the development of forestry, livestock and fisheries services.

5. Towards the end of 1958 the Legislative Assembly adopted a short range development plan covering a period of three years. The plan envisaged:-

1. the subdivision and development of five areas of vacant Government land (approx. 18,000 acres) for settlement;

2. the expansion of the extension services and experimental work of the Department of Agriculture;

3. the construction of more feeder roads;

4. the initiation of engineering surveys for potential deep-water berths in Apia and in Savai'i, and

5. the investigation and encouragement of secondary industries.

The vital importance of this plan to the welfare of the Territory is so obvious that its implementation, even by stages, would appear to be a matter of commonsense and urgency.

SECTION I

AGRICULTURE IN WESTERN SAMOA - 1959

FACTORS AFFECTING PRODUCTION

Climate:

6. Generally, weather conditions for a large part of the year were favourable for all agricultural activities. Strong winds experienced during January, had slight adverse effect on banana production during February; and very heavy and continuous rains during December caused some loss of late cocoa crops and interfered with drying of copra and cocoa beans. The somewhat prolonged dry weather during the third quarter, concurrent with seasonal effects of disease, resulted in considerable losses of bananas during transport and storage; and for several shipments, growers found it difficult to pack fully up to quotas allocated.

The meteorological data for the year are given at Appendix I.

Manpower:

7. Many planters reported local shortages of plantation labour and in some cases endeavoured to meet the position by resorting to various forms of mechanisation. For example, to control weeds in cocoa plantations, several planters began to use chemical weed spraying; and in general reorganised their operations on more efficient lines. The continued high prices for copra and the demands of the banana industry are factors which tend to attract plantation workers from casual employment to the cultivation of their own family lands.

Markets and Prices:

8. The sustained, and in some cases improved, demand for and prices offering for the major products provided useful incentives to production.

Product	Average Price f.o.b. Apia				Remarks
	1956	1957	1958	1959	
Bananas (per case)	£1.0.9.	£1.2.3.	£1.3.0.	£1.3.0.	Price to growers 10/- per case plus 1/- bonus paid in Dec.
Cocoa (per ton)	£207	£250	£305	£275	First grade. Price to growers 115/- per 100 in December.
Copra (per ton)	£ 58	£ 54	£ 80	£ 80	Prices to growers 49/-, 47/-, 44/- per 100 lbs in Dec.

Food Planting:

9. Throughout the year there were ample supplies in all districts of staple food crops - bananas, taro, ta'amu and breadfruit, and planting was well sustained. Consequently the production of copra and bananas and certain other export crops was in no way affected by seasonal food shortages.

Pests and Diseases:

10. The adverse effects of pests and diseases on production of cocoa, copra and bananas were slightly improved as compared with previous years. Very important advances were made in the control of bunchytop virus disease of bananas and rhinoceros beetle on coconuts; and the main food crops were less severely damaged than in previous years. The effects of leaf-spot disease on banana production were seasonally serious owing to the effect on storage and ripening behaviour of fruit from affected plants. Provision was made late in the year to organise field control of this disease. Several new pests and diseases of economic crops recorded are described below at paragraph

Communications and Transport:

11. "One has only to travel over the roads put in over recent years to see the tremendous stimulation they have provided towards increased production", Editor, Samoa Bulletin, 13 November, 1959.

Construction and improvement of main roads in Savai'i and Upolu continued steadily while, under the Development plan, provision for work on subsidiary roads enabled valuable P.W.D. assistance to be given to many access and feeder roads serving new areas of agricultural development. All such roads were inspected and their value, present and potential, assessed as a basis for recommendation. In most instances, Samoan villages authorities organised the necessary labour for formation of new roads and the Public Works Department supplied trucks, tools and surface metal or scoria. Arrangements were made for any costs to be met by deductions from banana payments. Banana Contractors improved the standard of their fleets of vehicles and vessels.

Shipping:

12. The Department was associated with the investigations undertaken on harbour surveys in Savai'i and Apia, and with the development of small loading jetties at Asau and Sala'ilua. In December, the Government agreed in principal to assist in the building of a district wharf at Fagamalo. The improvements of roads and jetties have been of great importance to the banana industry.

Air Services:

13. The decision of two operators to institute air services between Upolu and Tutuila, and possibly Savai'i also, are of interest and incidentally increase the Department's problems of plant and animal inspection and quarantine.

Overseas Shipping:

14. Schedules were adequate for all purposes - the three banana carrying vessels M.V.Tofua, Matua and Tarawera maintaining regular schedules and the M.V.Crusader, the Indian and Argentinean Reefers taking occasional shipments.

Cooperatives:

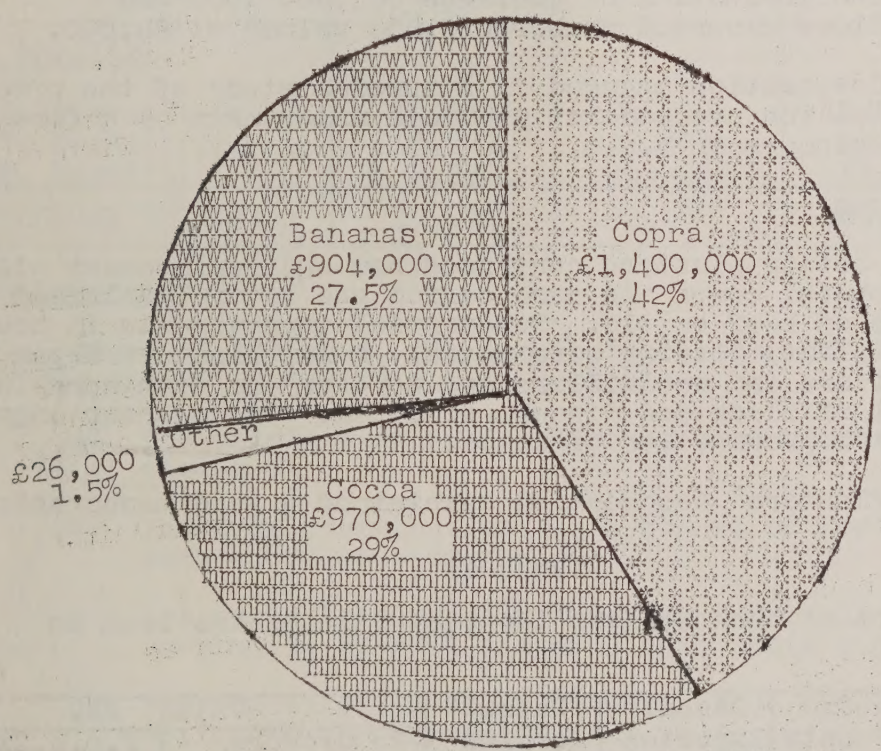
15. The set back experienced by the Cooperatives' movement due to the failure of consumer cooperatives, was a disappointment because it affected the whole atmosphere of cooperative development and delayed the expansion of producer and marketing cooperatives which could be progressively valuable channels for productive effort in the development of agriculture, fisheries and forestry. There are many activities in these fields of endeavour which are dependent upon the kind of group effort and remuneration which effective cooperative organisation can provide.

2. THE PRINCIPAL CASH CROPS

16. Appendix II summarizes the recorded and estimated production of the main cash crops, both for export and for local consumption and sale.

17. The total value of these crops produced in 1959 was approx. 3½ million: for export, £3,300,000; for domestic use and sale £250,000.

18. The relative value of the principal export crops is indicated in the diagram:



TOTAL VALUE OF AGRICULTURAL EXPORTS 1959 = £3,300,000 (approx.)

Copra	£1,400,000	-	42 per cent
Cocoa	970,000	-	29 " "
Bananas	904,000	-	27.5" "
Other	26,000	-	1.5 " "

W.S.T.E.C. and other Estate Production:

19. A major factor in the agricultural development of the Territory is the productive effort of the W.Samoa Trust Estates Corporation and of the individual estate planters.

Details of W.S.T.E.C. production and development for the year ending 31st March are given in the Annual Report (2) but the major items may be recorded as follows:-

A. Land development - Recent new plantings comprise:-

Coconuts: 2046 acres; Cocoa 273 acres
Coffee : 351 acres; Pastures 1650 acres.

B. Crop Production:

Copra : 1625 tons valued at £90,832
Cocoa : 427 tons " " £136,558
Coffee : 54 cwt. " " £1,200

Reductions in the costs of production were reported:

Copra £3 and Cocoa £10.

C. Livestock: Developments included the construction of a central abattoir at Vailele, a retail Butchery at Apia, and new dairy and piggeries at Vailele.

The production of beef was 863,808 lbs. and Hides exported numbered 2,454 valued at £4,800.

The Corporation engaged in a special study of the processing and potential for new coconut products undertaken by a firm of chemical engineers in U.S.A.

Other Estates:

20. Many estate planters continued new and replacement planting of coconuts, cocoa and some coffee and several enlarged their herds of beef cattle. Substantial improvements in housing, processing plant, roading were noted. A few planters began to use fertilizers and weedkillers and to carry on with spraying for control of black pod disease of cocoa. One planter engaged in vegetative propagation of cocoa.

The Planters' Association maintained a good membership.

BANANAS

21. Export of bananas over the past 5 years has been as follows:-

Year	No. of Shipments	Cases Exported	Cases Surplus	Value £S. To Growers	Value £S. f.o.b.Export
1955	-	445,870		200,642	429,150
1956	-	293,979		132,290	305,000
1957	24	328,569	4,876	182,502	351,966
1958	40	884,080		442,040	1,016,692
1959	41	785,950		432,591 (incl.bonus)	903,842

The number of cases exported was 98,130 less than in the previous year. This was probably due more to reduced market demand than to any short fall in production. There was some falling off during October due to effects of dry weather and premature ripening, and the total number of rejects at Apia and Salelologa 25,000, was more than double that for the previous year. The market conditions demanded quality improvements which could only be met by more severe inspection at depots and wharf.

22. The district production showed considerable changes due to various causes; in Safata, Lefaga and the S.W.Coastal areas the effects of disease resulted in a marked decline; but in Savai'i production increased to nearly 190,000 cases as compared with 37,404 in 1957 and 152,188 in 1958. The district figures for the past three years are as follows:-

District	1957	1958	1959
A. UPOLU:			
Aleisa-Lepale	74,940	138,037	114,219
S.E.Upolu	41,550	123,298	125,931
Safata	38,312	127,083	79,894
Falealili	36,897	100,252	74,774
Lefaga	28,819	37,127	6,161
N.East Upolu	30,536	78,349	86,714
N.West Upolu	20,577	73,228	69,614
S.West Upolu	11,841	37,742	21,348
Fagaloa	10,912	20,589	18,131
TOTALS:	294,084	735,705	596,336
B. SAVAI'I:			
S.E.Savai'i	24,517	94,099	110,142
N. Savai'i	8,647	23,823	27,335
W. Savai'i	4,240	34,266	52,137
ANNUAL TOTALS:	37,404	152,188	189,614

New Projects:

23. Approval was given for the appropriation of £25,000 for the purpose of improving banana production by:

a) the accelerated eradication of bunchytop virus disease;

b) the free distribution, as a bonus, of fertilizers to some 4,600 growers;

c) the establishment of a spraying and field sanitation service to control and eradicate pests and diseases;

d) the installation of pilot cool-store and ripening equipment for controlled observations on the seasonal behaviour of Samoan bananas.

In addition, in order to protect fruit awaiting shipment in Savai'i, two 60' x 30' prefabricated steel-frame buildings were erected, one at Sala'ilua in Salega and one at Asau in Gagaifomauga. It was possible to site both these buildings on existing privately owned jetties, whose owners willingly cooperated with the Department; but the construction of a third shelter at Fagamalo was temporarily delayed and it is now

anticipated that a new jetty will be constructed by the people of Saleaula district and that a shelter will then be erected at this shipping point.

Freight Increases:

24. The decision of the Union Steamship Company to increase freight rates resulted in an increase of .75 pence in the landed cost of cases in shooks.

Bonus Payments:

25. In December, a bonus payment totalling £39,616 was made to 4,600 growers who had exported 792,333 cases during the year ended 30th November, 1959. The total payments to growers amounted to £432,591.

All these developments have had a beneficial effect on the banana industry and the prospects for continued high production in 1960 are good. Current circumstances and experiences during the past year demand that emphasis continue to be laid on the need for improved quality standards for Samoan bananas; and growers have been urged to accept the full responsibility for continued improvements in the local pack.

Quality of Banana Exports:

26. During the year, there were two periods, May-June and September-October when the arrival condition of Samoan bananas were adversely reported on. This seasonal weak storage behaviour of fruit appeared to be associated with climatic, soil and disease factors and with the neglect of some growers to pack only sound fruit. Two officers of the Department visited New Zealand at the invitation of Messrs Fruit Distributors Limited to see the condition of Samoan bananas during storage and ripening.

27. Locally, port inspection services were strengthened - additional supervisors were allotted to country packing centres, and concentrated efforts were made by groups of field officers to eliminate substandard fruit. Some 25,227 cases were rejected at Apia and Salelologa; this being over 3 per cent of total shipments as compared with 1.5 per cent in the previous year. By the end of the year with the arrival of rains, the overall quality and grade of export fruit improved considerably.

28. A feature of the 1959 production was the greatly enhanced level of mutual cooperation and confidence which has developed between growers and officers of the Department. In spite of difficult road conditions in Upolu and Savai'i the cartage contractors maintained a most satisfactory service at all times. On two occasions only, sea transport losses incurred: a) the late delivery of 1,000 cases following engine trouble and b) the loss of 1000 cases in shooks, following the stranding and wreck of a vessel en route to Savai'i.

Growers Liaison:

29. The successful maintenance of the banana industry demands a close liaison and cooperation with nearly 5,000 individual growers. It is estimated that during an average banana shipment covering three days some 20,000 persons are employed harvesting, transporting, packing, handling and transporting bananas. To ensure a high standard of efficiency it is necessary that departmental officers operate closely with these workers. Apart from the field inspections on which allocations are based, and the plantation services for fertilizer distribution, pest control

and so on, direct contacts are maintained by the field supervisors at depots, by the pay-out teams, by regular circulars to all growers, and by growers' meetings and radio broadcasts. Many district meetings were held during the year and growers were invited to two meetings in Apia to discuss banana problems with the General Manager and staff of Messrs Fruit Distributors Limited. These meetings were well attended by up to 200 growers who thus had the opportunity to make their own views known and to learn more about the industry at first hand.

Following the study visits to New Zealand by two senior officers, meetings were held in all districts for the purpose of reporting their observations.

The demand made upon growers to maintain 41 shipments averaging over 19,000 cases each, regularly throughout the year in all kinds of weather, was a heavy one; and a tribute is paid to the unflagging energy and the initiative of the men and women who grow the fruit and fill the cases.

Banana Diseases:

a) Bunchytop Virus:

30. The spread of bunchytop virus disease in Upolu has been cause for concern and action. Following the introduction of controlling legislation (Bunchytop Ordinance) early in the year, a campaign of eradication was organised by the Entomologist in April and this made remarkable progress. The island of Upolu was proclaimed an infested area, and inspectors were appointed to supervise the work which was carried out in collaboration with the growers, and the district and village authorities. In several areas the cooperation of Samoan growers was outstandingly good.

In the districts of Safata, Lefaga, Tanumalala and Aigaile-Tai and in part of Falelatai, all diseased plants have been eradicated; but there has been some regrowth which will require attention. Other centres of infection in the Tuamasaga district and in Savai'i have also been dealt with.

32. During 1960, the remaining known infested areas in Upolu will be dealt with and every attempt made to prevent the disease becoming established in Savai'i. Great credit is due to the officers engaged in this difficult and exacting campaign - which has been carried out efficiently in difficult terrain, at a cost of £3,029 todate.

b) Leafspot disease:

33. The adverse effects of this disease on the quality and behaviour of bananas in transit and storage were evident during September and October and steps have been taken to carry out field control work during 1960. This will be based on the results of experiments carried out at Nafanua (see para.101).

Banana Pests:

34. The successful introduction and establishment of the Plaesius beetle which is a predator of the damaging stem weevil borer has been recorded by the Entomologist. The borer has also been successfully controlled by use of chemicals.

In general the scabmoth pest of banana fruits has been well controlled by the consistent use of DDT dust - large quantities of which were made available to the growers.

COCOA

35. All aspects of this important crop demand much greater effort than is currently being exercised - both in the care and management of the trees and in the proper handling and processing of the crop. Unfortunately there is insufficient incentive by way of local buying price margins, to encourage growers to produce good quality cocoa, and action to improve the overall quality of cocoa lags well behind that applied to copra and bananas.

For the calendar year there was an increase of 160 tons over the previous year's production, approximately 66 per cent being exported as first grade beans.

Exports of Cocoa Beans 1955/59

Year	Cocoa Beans (Tons) 1st Grade	2nd Grade	Nibs	Total	Shells Tons	Total All Grades	Value £
1955	N.A.	N.A.	N.A.	3,116	75	3,191	882,510
1956	..	..	..	3,215	125	3,340	668,171
1957	1,850	979	139	2,968	108	3,076	725,117
1958	2,617	1,089	157	3,963	166	4,029	1,230,881
1959	2,654	1,164	192	4,010	179	4,189	969,860

36. The destinations of the year's export crop of cocoa beans were: United Kingdom 2,202; United States of America 1,053; New Zealand 333; Australia 317; Germany 283 tons respectively. An experimental consignment of approximately 10 tons of unwashed and ungraded beans was shipped to Tasmania for examination processing and report. The production for the past two "world cocoa years" (October-September) was: 1958 3,575 tons; 1959 4,463 tons.

Prices:

37. The average prices for 1st grade cocoa during the past five years were:-

Year	Average value (fob) £.
1955	£282.0.0.
1956	207.0.0.
1957	250.0.0.
1958	305.0.0.
1959	275.0.0.

Quality of Cocoa Exports:

38. There was little change in the local quality standards for export beans; 1st grade, 66 per cent; 2nd grade, 29 per cent and nibs, 5 per cent; but from time to time there was little or no market demand for second-grade cocoa. During the year, the Department continued to demonstrate the benefits of proper fermentation and drying, and a few traders commenced to process wet beans under licence.

39. Late in the year, Mr P.D. Lloyd, Chairman of Messrs Cadbury, Fry, Hudson & Pascall Pty., Ltd., and Mr D.H.Urquhart, specialist advisor from Messrs Cadburys Ltd., England, visited the Territory to study local methods, quality standards and potential production. They visited many cocoa areas in Upolu and Savai'i and with the cooperation of producers arranged for experimental processing of locally produced cocoa beans.

40. During the year, 394 cocoa trading licences were issued and 43 persons prosecuted for breaches of cocoa quality regulations, with fines totalling £140.10.0.

Pests and Diseases:

41. Steady progress is recorded by Departmental services dealing with the control of pests and diseases in the plantations and storehouses. Regular spraying of the latter and also fumigation of nibs and shells prior to shipment was carried out. The problems of cross-infestation of cocoa beans in ships' holds is being investigated.

Black-pod canker and pink diseases were prevalent and planters complained of losses caused by rats. Expansion of field services to meet growers' demands was limited only by the pressure of other priority work.

Crop improvement:

42. Departmental activities in the field of crop improvement are described elsewhere in this report. There was a marked increase in growers' interest in, and demand for, selected plant material, pruning and spraying field services.

COCONUTS and COPRA

43. The planting of coconuts by Samoans was inadequate to provide replacement for increased domestic consumption and for loss of palms due to age and other causes. The estimated requirement is 200,000 palms per annum (= 4,000 acres) equivalent to 1,000 palms per village. The estimated area planted by Samoans was 300 acres. A major contribution was, however, made by the Western Samoa Trust Estates Corporation which reported 2,046 acres of new coconut planting.

44. Export production of copra over the past five years is as follows:-

COPRA EXPORTS 1955-59

Year	Tons shipped				Value (fob)£	Remarks
	H.A.D.	S.D.1.	S.D.2.	Total		
1955	N.A.	N.A.	..	17,178	1,148,739	
1956	1,256	12,160	..	13,581	817,494	
1957	2,598	2,978	8,748	14,325	811,441	
1958	3,827	5,653	4,075	13,731		include 176 tons from Tokelau Is.
1959	8,442	4,890	3,508	16,840	1,400,000	198 tons from Tokelau Is.

The marked increase of more than 3,000 tons over that of the previous year was due to the continued high prices offering and to the effect on the crop of the favourable weather conditions carrying on from the previous year. The benefit also of the expanded field control of the rhinoceros beetle was seen in the improved bearing of many palms which previously had no or little crop.

45. The Copra Board continued to market all copra produced; and, in order to sell to the best advantage, sold copra to several markets as shown below:

Destination	No. of Shipments	H.A.D.	S.D.1.	S.D.2.	Total
1. New Zealand	18	1,505	1,122	899	3,526
2. United Kingdom	8	4,174	2,199	1,461	7,834
3. Hamburg	1	150	150	-	300
4. Rotterdam	2	1,430	852	718	3,000
5. Japan	2	763	217	200	1,180
6. South America	1	419	351	230	1,000
TOTAL	33	8,442	4,890	3,508	16,840

Market:

46. Prices on C.I.F. basis, improved considerably during the year - but were generally erratic, rising to £100 per ton in May then dropping to £75 in September, reaching £97 per ton in later October and £84 at year's end. The total export value of copra was £1,400,000.

Prices to growers (per 100 pounds dry copra) were set by the Copra Board in March as follows:-

District: Apia :	HAD, 50/-;	S.D.1. 48/-;	S.D.2. 45/-
Districts: A & B:	" 49/3;	" 47/3;	" 44/3
" D :	" 49/-;	" 47/-;	" 44/-

Although market prices changed during the year, falling in June by £8 to £10 per ton and in August by £30 per ton, the local price to growers was sustained until December when all grades were reduced by 5/-

Copra Quality:

47. It is obvious that there has been a continued improvement in quality due largely to the development of hot-air driers which now number 251 comprising:

18 platform tray driers
167 flue driers
66 open hearth driers

Of the total production, 79 per cent was first grade (50 per cent H.A.D. and 29 per cent S.D.1.). In 1956, only 1,256 tons of hot-air dried copra was produced i.e. 9 per cent of that year's total production. Such then, is the remarkable contribution made by Samoan producers over the past three years!

The Chief Inspector issued 440 licences for copra traders and 29 licences for purchase of undried kernel.

Fines for substandard copra totalled £254 (72 prosecutions) as compared with £1,120 (283 prosecutions) in 1956.

Pests of Coconuts:

48. Field control of the rhinoceros beetle continued as a priority project in the programme of the Pest Control Division.

The results achieved by the district teams, organised by the Entomologist to destroy breeding places, fully justify the view that this is the most effective means of control at present available. Under energetic and responsible control, and with the willing cooperation of district authorities and people, very significant advances have been made; and in many districts the good effect of this work is to be seen in the improved condition of palms.

49. Very careful consideration was given to proposals to re-introduce a system of payment to encourage regular searching for beetles and larvae. Since the Rhinoceros Beetle Ordinance 1954 provides that all occupiers of land are required to control beetles and since it has proved more effective to eradicate the breeding places than to collect beetles, it has been strongly recommended that the present methods should be continued.

In all districts, cooperation of the people has been very good in general; but fines totalling £336 were imposed on 179 persons who failed to carry out inspectors' instructions.

OTHER EXPORT CROPS

50. There was no marked increase in export of minor products during 1959 but trial consignments of new items included nutmegs, mace, capsicum, eggplant, fresh pineapples and dried bananas (chips). The main items exported privately or on consignment to New Zealand and American Samoa included:

	Cases	Sacks
Bananas	681	1,331
Coconuts	203	154 (20)
Taro & Ta'amu	581	4,310
Yams	20	12
Nutmegs & Mace		50
Kapok		64
Avocado	371	
Pawpaw	1,539	
Mangoes	144	
Pineapples	96	
Citrus	114	
Vegetables (misc.)	190	

Approximate total value = £26,000

Coffee:

51. Although no export of coffee beans was recorded, there was considerable development of this crop, not only by Western Samoa Trust Estates Corporation, but also by small growers with areas from one to 30 acres. The potential total production is estimated at 60 tons but not all of this was harvested and proceeded. The known amount marketed during the year, was 24 tons all of which was utilized for local consumption. The areas devoted to this crop are estimated to total 600 acres; - but shortage of labour has caused some planters to withdraw their interest in it.

Mr F.M. Jahnke, an experienced coffee producer, has recorded (3) some valuable observations on the cultivation and processing of coffee which are briefly summarized:

a) Samoan coffee is of very good quality;

b) good average quality demands skill in handling and preparing the beans;

c) coffee can easily be grown in large quantities in Samoa;

d) Samoa should have a central treatment plant in order to establish a high standard of grade and quality;

e) the Department of Agriculture should instruct growers in the proper way to prepare coffee for market.

52. The Department endorses these competent observations. It is known that Western Samoa Trust Estates Corporation has installed modern machinery at Tuana'imato Plantation for the bulk processing of the coffee crop and it would be most economic if growers could arrange for their berries to be processed and graded there.

The Department has prepared proposals for the proper grading of coffee beans; but regulations would be required to ensure that only good quality graded beans were offered for export.

In the meantime the Department is actively engaged in experimental and advisory work on this crop.

Pineapples:

53. The export of pineapples was limited to one trial shipment made by the Department and by a few private consignments. This crop grows very well and the Minister of Agriculture proposed that early attention be given to its development. This matter is in hand. Other crops which can be developed with every chance of success are avocados, citrus fruits, pawpaws, nutmegs and certain vegetables. Trials and investigations are proceeding.

4. PASTURE and FODDER CROPS

54. There was considerable interest in the establishment of improved pastures for cattle by the planting of grasses and legumes. The most popular were elephant, java and batiki blue grasses, pueraria and Centrosema and large quantities of seeds and plants of these were issued from Departmental stations. New pastures totalling some 2,000 acres, including 1,650 on Western Samoa Trust Estates Corporation property, were thus established.

Pasture pests, mainly army worms, were not as serious as in previous years and there was some effort at chemical weed control in several areas.

The spread of the giant sedge - Cyperus aromaticus in Upolu represents a major threat to the Territory's grazing areas. With the cooperation of several overseas firms and of the Western Samoa Trust Estates Corporation, control trials with chemicals were undertaken.

Elephantopus continues to be troublesome in village malae and in pastures. Very considerable progress has been made with its control; and it is hoped, in 1960 to obtain parasites to assist the work.

II LIVESTOCK and FISHERIES IN W.SAMOA

"Greater attention should be given to the possibility of developing a livestock industry on Samoan land"- Report of United Nation's Mission - April 1959.

55. It continues to be difficult to obtain reasonably accurate statistics of livestock and the following figures prepared for the Annual Food&Agricultural Organisation questionnaire are approximate only:

	1956	1957	1958	1959
Cattle:				
Beef	13,000	13,100	13,600	14,000
Dairy	400	500	600	650
Pigs:	55,000	60,000	60,000	65,000
Goats & Sheep:	-	-	328	250
Poultry:				
Fowls	102,000	250,000	380,000	400,000
Ducks	500	600	600	600
Geese	100	100	100	100
Equines:				
Horses	2,700	3,000	3,500	3,100
Asses	200	150	200	240

Notable advances were the establishment of new dairies by Western Samoa Trust Estates Corporation and Avele Agricultural College and the importation of selected dairy cattle (Jersey bulls and heifers)and large white pigs.

Beef Production:

56. The available figures are as follows:-

Year	Animals Slaughtered		
	Number	Average Weight (lbs)	Lbs.
1955	2,000	N.A.	800,000
1956	2,150	350	860,000
1957	2,500	350	874,000
1958	2,454	352	863,808
1959	1,813	350	634,500

Hides:

57. Export of hides over the past five years have been:

Year	Hides exported		Export value (£)
	Number	Weight (lbs.)	
1955	126	5,040	45
1956	1,136	45,440	405
1957	2,677	87,080	5,250
1958	2,621	87,000	5,242
1959*	1,543	46,220	3,086

* Year ending 31st March, 1959

As there is no Veterinarian in the Territory, all hides for export must, under New Zealand Animal Quarantine regulations, be provided with a certificate signed by the Director of Agriculture and the Director of Health in order that they may be admitted into that country. The quality of W.Samoa hides continues to be very satisfactory.

Milk:

58. The estimated total fresh milk production was 28,000 gallons valued at £5,600.

Poultry:

59. With a good potential market locally and in American Samoa for poultry products, several local residents have introduced modern equipment and housing for the commercial raising of chickens. By using imported day-old chicks and pullets and by keeping these in pens with wire floors off the ground, very good results have been achieved in the production both of eggs and of poultry meat. Since the annual import of eggs from New Zealand totals approximately 20,000 dozen it is believed that the development of the industry would be of great benefit to the Territory.

Following representations made on behalf of poultry farmers, the duty of 25 per cent on imported poultry feed and concentrates was reduced to 5 per cent.

Several thousands of day-old chicks were imported by air from Fiji and New Zealand. The Department issued a warning regarding the dangers of animal importation from Australia and U.S.A. due to diseases which exist in those countries and in December it was necessary to prohibit the further importation of poultry carcases from countries where New-Castle and other virus diseases occur.

Animal Imports:

60. These are summarized from the report of the Senior Produce Inspector.

Cattle:	Bulls 4 :	Heifers 8		
Pigs:	58			
Poultry:	Fowls:	Pullets 160:	2200 day-old chicks,	
	Geese 6			
Dogs 3:	Cats 1			

Amongst these imports were two high-grade Jersey bulls and 7 Jersey heifers in calf and 34 large white pigs, the remainder being domestic animals imported from Tonga and Western Samoa usually for ceremonial purposes.

Diseases of Livestock:

61. This important branch of animal husbandry continues to be largely neglected, as, apart from the demi-official services of an officer in the Health Department, there is no departmental provision and no facilities or staff to carry out the necessary work. The problems of importation and export of animals and animal products alone constitute a serious menace to the Territory's welfare.

Fisheries Development:

62. No new developments were recorded in 1959 - departmental activities described at para. 130 below indicate some small progress in a preliminary approach to the local studies of marine fishing methods and prospects. A visit from the South Pacific Commission Fisheries Officer is anticipated during 1960 when some investigations will be undertaken and a programme drafted.

III : FORESTRY IN W.SAMOA 1959

"It is hoped that support will be forthcoming for an active programme of forest conservation and development, both to meet the urgent need for the protection of water-sheds and to provide a supply of timber" - Report by United Nations Mission.

63. Apart from departmental activities there have been no new developments in forestry. Two sawmills continued to operate in Upolu - mainly for the production of building hardwood timber. One mill continued with the production of local banana cases of which approximately 60,000 were supplied under contract to Government.

64. In the absence of an organised forest service and of the cooperation and support of land-owning groups, little progress can be expected in the important work of conserving and developing existing forest areas for utilization and for the protection of watersheds and high country; but the immediately practical task of developing village wood lots to provide house and boat building timbers and domestic firewood is within the capacity of village and district authorities. In the course of forest clearing for agriculture there is much wastage of potentially valuable timber trees which, if salvaged and converted, would provide much useful material. At present the natural forests are a dormant, and in some cases, a wasting asset.

Departmental forestry activities are described at para. 139 below.

SECTION II

THE DEPARTMENT AND ITS WORK - 1959

ADMINISTRATIVE SERVICES

Staff:

65. The professional staff position deteriorated during 1959, with the result that the rapidly growing services had to be sustained by a fewer number of controlling officers.

Retirements and Resignations (Senior Staff)

The Marketing Officer retired on 31st July, the Agricultural Officer, Development resigned on 31st May, the Principal, Avele Agricultural College resigned in September. None of these were replaced by year's end.

The pending departure of the Senior Agricultural Officer (Mr A. Higgins) and the Entomologist (Mr P.S.Dale) early in 1960 represents a distinct loss - as during the past three years both these officers have done outstanding work in their respectiv fields. For six months the former acted as marketing officer conjointly with his other duties and also supervised the fisherie section and on two occasions acted as Officer-in-Charge of the Department. A public tribute to the services of Mr A.M.Pavitt was made at the time of his retirement after many years' serivce with Western Samoa Trust Estates Corporation and the Department.

It is a pleasure and a duty to record the valuable and efficient work of all members of the staff during what may be described as a particularly difficult and onerous period.

Leave and Overseas Duty:

66. The Director returned from vacation leave on 5th March - and was absent during July on official duties attending the S.P.C. Research Council meeting; the Senior Agricultural Officer and the Agricultural Officer were each absent from one month on banana investigation in New Zealand.

Promotions:

67. The Chief Inspector of Produce (Mr V.A.T.Leavasa) was promoted to Agricultural Officer as from 1st July - and assumed responsibility for extension services in the island of Savai'i.

New Appointments & Replacements:

68. Agricultural Officer as from 13th January 1959
Assistant Master, Avele Agricultural College - 19th May, 1959;
Administrative Officer (Acting) as from 9th June, 1959;
Agricultural Officer as from 19th November, 1959;
Senior Field Assistant as from 27th May, 1959;
Various vacancies in the subordinate staff groups were filled by local appointments.

Pulefa'atoaga:

69. These officers and their messengers (leoleo) continued to support the district field work of the department and some of them gave most valuable services in connection with supervision of banana packing and field control of banana virus disease and rhinoceros beetle pest of coconuts. In September these officers completed their term of three years and were

Transport and Equipment Control:

73. The control and maintenance of departmental mechanised equipment - vehicles, sprayers, dusters, tractors and saws, was organised by the Agricultural officer and the Entomologist assisted by one Field Assistant, whose work has been highly commended. The strict procedures and rules established have, with the cooperation of the staff, resulted in a very satisfactory standard of efficiency and economy in the use of equipment and vehicles.

Boards and Committees:

74. The Director was a member of the following:- Land Use Committee (now Land Board), Western Samoa Trust Estates Corporation Board; S.P.C. Local Committee. He also attended meetings of the Copra Board and interviews with U.N. Delegation. He attended as a Member, the 10th Meeting of the South Pacific Commission Research Council held in Noumea during July.

The Entomologist was a member of the S.P.C. Advisory Committee on Oryctes Research and attended a conference in Fiji.

Special Investigations:

Cocoa and Copra Analyses:

75. Commencing in September, 1959 laboratory work on cocoa and copra analysis got under way with the setting up of new laboratory equipment including an automatic electric oven and electric probe testers. It is possible now to determine with accuracy moisture content of cocoa and copra, which is of great assistance to copra graders and Inspectors of the Department of Agriculture, and also by using the oven to check and calibrate the portable meters. Several disputes arising between graders and producers were quickly settled by using the new analysis system.

Since September, up to 40 samples of cocoa and copra Departmental and sent in by firms, have been dealt with. It is hoped that with more staff members acquiring the skill to carry out these operations, much of Samoa's export of copra and cocoa will be subject to sampling and testing to ensure its place in world markets. Proposals for carrying out other analyses, e.g. free fatty acid and oil content of copra have been submitted.

Plant research:

Many enquiries regarding economic and other plants were dealt with and a reference list of Samoan plants prepared.

As in previous years the technical work of the Department is described in the divisional reports prepared by the Senior officers, which are summarized in the following paragraphs.

AGRICULTURAL EDUCATION

76. Progress in the field of agricultural education included:

a) Development of the Avele Agricultural College - buildings, lands, library and teaching courses;

b) Continued development of the College Farm;

c) Field Days and Demonstrations at stations and on plantations;

d) Staff training in crop husbandry, pest, disease and weed control and processing of cocoa, copra and other produce;

e) Overseas training.

AVELE AGRICULTURAL COLLEGE AND SCHOOL:

77. Building construction provided for in the 1959 estimates, was delayed owing to unexpected curtailment of Public Works capacity. New quarters for the Assistant Master were not completed by year's end and construction of two tutors' houses was not commenced. Early in the year the dining room and kitchen was fully equipped and put into operation. A belfry for a ship's bell donated by the Union Steamship Company was constructed. Essential alterations to the Laboratory and the laying down of new playing fields was not possible.

Staff:

78. With the resignation of the Principal in August, the Assistant Master (Mr I.L. Milne) assumed duty as Master-in-Charge. Under his competent supervision and with the able assistance of the supervisor Primary classes, Mr D.L. Jones, and the Samoan staff good progress was made with the reorganisation of the programme of studies.

The report of the Master-in-Charge is as follows:-

Roll:

79. During 1959 there were 67 agricultural students in Forms 3 and 4 in the College as follows:-

	Form III	Form IV	Total
From Cook Islands	6	7	13
Niue	2	3	5
American Samoa	2		2
W. Samoa	26	21	47
	36	31	67

Also for the primary Department Forms 1 and 2 were retained with a total of 65 pupils all from W. Samoa.

Summary of Activities:

80. February 2nd, Term 1 commenced with the Principal, the Supervisor Primary classes, one temporary assistant and four Samoan teachers. On February 16th the Agricultural Officer, Headquarters took up part-time teaching duties. Term closed on May first.

During this term, several fales were rethatched, two cooks and a laundress appointed, and various minor alterations made to school and compound buildings. The Supervisor, primary classes took over teaching duties in the Secondary Department. This meant that all the Primary teaching was done by the Samoan staff. Several important visitors came to the College viz. High Commissioner and Secretary, Island Territories Department, United Nations Mission, S.P.C. Delegates, and the Inspector of Island Schools. A bell was presented to the College by the

Union Steamship Company at a ceremony on April 4th. The Colleg syllabus followed broadly a New Zealand syllabus, with some general Agriculture, and other subjects related to Agriculture as much as possible.

81. Second Term commenced on 19th May. The Assistant Master arrived from New Zealand, to take up duties as Science and Agriculture teacher. Two students left, reducing the roll to 65. A very generous gift of books for the Library was received from the Education authorities of American Samoa. Teams were entered in both A and B grade Samoan Cricket competition, and won both grades. Visitors of importance were Dr C.E.Beeby, Dr B.C. Lee and Mr J. Leggat in June. A track was cut and levelled by the students so that a swimming pool could be readi available. Progress was noted in most subjects of the curricul The whole school went on malaga to Lalomanu, Aleipata for two days, and this proved both educational and entertaining.

On 21st August the Term closed, the Principal resigned an returned to New Zealand.

82. Term 3 commenced on 7th September, with some reorganisati of staff.

Control of the College was divided as follows:-

Supervisor of Primary Department; Boarding establishment, Students and Compound control out of school hours;

Master-in-Charge: supervisor of Secondary Department, timetables and schemes of work, office and school records, staff discipline and organisation.

This division has worked quite well, and has made for easier work all round. The following officers of the Department taught specialized subjects:

Director:	Field Husbandry
Entomologist:	Entomology and Pest Control
Agricultural Officer:	Soils and manures

One Samoan teacher spent two days per week on farm liaison with the Farm Manager. Part of this work consisted in preparing weekly reports on farm activities for use in the classroom and in delegating farm duties to the students.

Programme and Syllabus:

83. The College syllabus was revised to bring it into line with the original plan for the College. The timetable analysis is now:

Subject	Form 3	Form 5	Form 5
English	10	10	4 (Technical)
Social Studies	5	3	2
Core Mathematics	5	3	5 (incl.Bookk
Manual	4	-	4
General Science	6 Ag.Chemis.	3	-
General Agriculture	4	6	9
Field Husbandry	-	3	2
Animal Husbandry	-	4	4
Forestry & Fisheries	-	2	2
Entomology	-	-	2
Music	I	I	I
	35	35	35

As specialist teachers of the Department of Agriculture were available, this has meant little change in the teaching subjects of the resident staff.

Student Field Projects:

84. a) The Social Studies survey of the compound has been completed;

b) Agriculture - Studies and observations of work carried out on both Avele Farm and Nafanua were done, and various demonstrations were arranged by the Departmental officers for the students.

Progress of Students:

85. a) The majority of the Form 4 students improved their standard to satisfaction.

b) With the exception of one or two boys, the 3rd Form progressed steadily.

c) The increased time devoted to English has paid dividends in the standard reached by all students.

Examination Results Form II:

86. For the Form II examination, 36 boys were entered but one boy was unable to sit through illness. Three boys who were transferred from Form I sat and were successful. All told, 28 of the 35 boys passed their examination. This appears to be a record for Avele, and reflects well on the teaching ability of the Samoan staff who had most of the responsibility for the classes.

Prize Giving Ceremony:

87. The ceremony was held on December 10th with the High Commissioner as guest speaker, and Mrs Powles presenting the prizes.

Library:

88. The library is gradually being built up to an effective unit in the College, and far greater use is being made of it by the students. Further gifts of books have been received, and thanks are gratefully acknowledged to His Excellency the High Commissioner, to the Education Department, American Samoa and to the Director for the excellent books they have presented.

Sports:

89. Students took part in the Inter-secondary schools' Athletic Tournament, and performed very well indeed. Results were much better than expected, as little time was available for practice, because of pressure of examinations and other work. An inter-house tourney was held on sports days during the term. Rugby, Softball, Boxing, Cricket and Athletics were all competed keenly. A trophy (Hardy trophy) was given for the winner of these sports, together with points awarded for the care of fale. Williams' House were the first winners of the trophy. A team competed in the European Cricket competition.

Overseas Visitors:

90. Amongst the many visitors were the following from overseas:

Mr E. Lawrence, O.B.E., Director of Agriculture Tonga,
Mrs Brant from U.S.A.,
Director of Education, Cook Islands,
Director of Education, American Samoa
Mr Reid, British Consular Agent in Tonga,
Messrs D.H. Urquhart and P.D.Lloyd of Cadbury's
50 L.M.S. Pastors and Dr J. Bradshaw,
Messrs McBean (Principal Niue High School,)Smith (Assistant Niue High School) and Flavell (Education Officer Niue).

General:

91. The change to the original proposed syllabus meant many changes in the College. It can be said now that the changes are for the good and have proven so. The students are much happier in their work, and are showing a very keen interest in all aspects of Agriculture.

As the food supply has improved during the year, so has the health of the students improved. At the end-of-year health check up, all students had put on weight, and in most cases, increased in height far more than in the previous year.

The majority of the overseas students have settled down well, and are applying themselves diligently. The most noted improvement in the second half-year has been in the students from Niue. These boys have worked hard, and in most cases improved their positions well.

One feature of the second half-year has been the settling down to work of the 4th Form Samoan students. The majority of these have worked well to gain the major places in class.

AVELE COLLEGE FARM:

92. The planned development of the College Farm continued steadily and efficiently under the supervision of the Farm Manager (Mr H. Treviranus) working with the Agricultural Office Development (Mr R.R.Barnewall) until May and thereafter with th Director.

Students participated in all aspects of animal and crop husbandry on the farm. Detailed quarterly reports have been published in "Laufasi Ola" (6) and the year's work may be summarized briefly as follows:-

The Farm comprises:

1.	Home farm	-	80 acres
2.	Vailima Fields	-	30 "
3.	Vaea Fields	-	150 "
4.	Alaoa Extension	-	20 "

The programme included the construction of access roads, the clearing of land, establishment of pastures and food crops, the installation of water supply and the construction of the dairy, implement shed and livestock buildings. A start was made with the building of a model piggery.

Land Development:

93. New areas at Alaoa and Vaea were cleared, fenced, roaded and planted; in the latter block, 90 acres were cleared, including 70 acres of dense Lantana thicket; and 87 acres subdivided into 6 grazing areas and 6 acres planted with taro. The grazing areas were planted with grasses and legumes - batiki blue grass, falefa grass, coastal bermuda and Paspalum grasses, and legumes Centrosema, Flemingia, Stylosanthes, leguminous trees, gatae and tamalini, were retained as browse fodder. In Alaoa area one acre of lucerne - three varieties, was grown with success.

The Home farm and Vailima pastures were improved by spraying for weed control, by further planting and sowing, and by careful management of cattle.

Livestock:

94. Two Jersey bulls and seven Jersey heifers in calf were purchased in New Zealand with the assistance of the Director, Animal Research Station, Ruakura. These have all thrived, and with the natural increase of 7 calves have greatly improved the standard of the dairy herd. The cattle now comprise two herds totalling 136 head as follows:-

Dairy cattle:	56 (including 16 imported Jerseys)
Beef cattle :	80 (including 3 bulls)

For eleven months (January-November) milk production totalled 5,766 gallons - the average daily production per cow being approximately 9 pints. The beef herd provided fresh meat sufficient for students' rations for nearly half of the school year.

Crops:

95. Considerable areas were planted to provide student rations:

Root crops -	taro, ta'amu, manioca and umala;
Vegetables -	corn, beans, tomatoes, chinese cabbage, cauliflower, pumpkins, pele;
Fruit -	Pawpaw, melons, pineapples, coconuts, bananas.

Over 60,000 taro and 4,000 ta'amu plants, approximately 13 acres were planted during the year. Pruning and fertilizers resulted in large crops of breadfruit.

Water Supply:

96. A small concrete reservoir was constructed to provide water supply to pasture and crop areas - and water pipes for vegetable gardens were laid.

Farm Production:

97. Produce from the farm used mainly for student rations included:

Milk	5,766 gallons,	Vegetables	5,323 lbs.
Taro	31,356 lbs.,	Ta'amu	7,558 "
Breadfruit	12,650 "	Fresh meat	7,383 "
Cassava	2,076 "	Fruit	564 "

The total value of the year's production was £2,028.

Overseas Training:

98. There were four students engaged in studies for agricultural degrees and diplomas at Massey Agricultural College, New Zealand. One of these completed the academic requirement for the B.Ag. degree and will proceed to the practical course before returning to Samoa.

During the year two members of the staff were selected for scholarships in Fiji at the Central Medical School - one to take the medical course and one, the dental course; and one officer has been nominated for an agricultural course under the Government of Australia Scheme.

In connection with the Crash-course in administrative practice, the Agricultural Officer, Extension was selected to proceed to New Zealand early in 1960 for a period of six months. There is still a very great need for the training of technicians and technical officers in specialized practical fields to provide the essential backbone to the agricultural development programme.

Staff Training (Local)

99. Senior staff have devoted much time to instructional work and there has been a good response and result seen in the improv efficiency of many junior officers. Special fields of instruction have been those of crop husbandry, pest, disease and weed control and the processing of cocoa, coffee, copra and other produce.

Staff meetings and demonstrations have been frequently held.

AGRICULTURAL STATIONS AND RESEARCH STATIONS

100. The present areas of land available for crop experimental research and demonstration purposes are not adequate. They comprise the following:- Nafanua 20 acres, Vailima (La'au) 2 acres, Tafaigata 5 acres, and Togitogiga 20 acres.

They are operated as follows:

a) Nafanua station is operated with the Vailima and Tafaigata cocoa areas as one unit under the supervision of the Director with Field Assistant Fa'asuaga as Senior Assistant;

b) Togitogiga Agricultural Station is operated as the Falealili district farm, under the supervision of the Senior Agricultural officer with J. Schwalger as Senior Assistant. (See para. 118);

c) Departmental livestock work is for the time being merged with developments at the Avele Agricultural College Farm.

NAFANUA-VAILIMA-LAFI

101. The work at Nafanua, associated with the cocoa areas at Vailima and Tafaigata continued to make good progress, but as a detailed report (4) has recently been published, a brief summary only is now made in the following notes.

New developments included the construction of a second Cocoa propagator house with Bahnson humidifier equipment, a petrol and oil store, 'Samoan' cocoa drier and completion of the plant house. Roads, hedges and fences were extended and new areas of land brought into use.

Programme:

102. The main activities were concerned with:

a) the introduction and propagation of crop plants, fertilizer and disease control trials for a number of crops e.g. bananas, cocoa, coffee, citrus, food crops and pasture plants;

b) the cultivation for export and trial shipments of eggplants, capsicum and solo pawpaws;

c) propagation, distribution of seeds, plants and cuttings to planters;

d) processing of copra, cocoa, bananas and coffee;

e) field instruction and staff training, field days for students, maintenance of clonal cocoa areas at Tafaigata (Lafi 7), Vailima (Trinidad clones and disease resistant clones), Nafanua (Fiji, Trinidad and Papua New Guinea types.)

Bananas and Manila Hemp:

103. The experimental area provided an impressive demonstration of the value of fertilizers and disease control as a means of increasing production for export grade fruit. The fertilized areas (NPK and PK) yielded at the average rates of 273 and 240 cases per acre respectively, as compared with 39 cases for the control area in which the growth was very poor. All fruit was carefully recorded for yield and quality - 191 cases being shipped from .6 acre. The treatments included a) fertilizers, sulphate of ammonia (N), superphosphate (P), and muriate of potash (K), together with manganese sulphate. The latter was applied both as a surface dressing and as a liquid spray to foliage. To control leaf-spot disease, Bordeaux mixture and Shell misting oil gave very useful results. The regular drying of reject green bananas was commenced in a trial to establish possible markets for this largely wasted product. Approximately 17 cwt. of dried bananas was prepared. Manila hemp plantings were extended.

Cocoa:

104. Twelve acres of experimental cocoa are now controlled by the Department; at Nafanua, Samoan cocoa in bearing, clonal cocoa 2-3 years old, clonal nursery (17 varieties); at Vailima (La'au) Samoan cocoa in bearing, clonal cocoa in bearing; at Tafaigata, Lafi 7 clonal cocoa in bearing and at Togitogiga Kerevat seedlings (12 varieties) in bearing.

From these areas, an increasing crop of pods and cuttings is being harvested for distribution to planters either as selected seed or rooted cuttings and also for experimental fermentation and drying. A great deal of work has been done in the various areas to control weeds, pests and disease, to establish shade, to prune trees and to apply fertilizers.

Cocoa Propagation and Distribution:

105. At Nafanua, cocoa propagation work has been expanded to meet the increasing demand from growers. Attention has been given to other methods including budding, air layering and use of polythene sheets. These require further study and experience.

Apart from plants required for departmental purposes, the following distributions were made in 1959:

Lafi 7:	Rooted cuttings issued to 20 growers ..	208
	Selected seed pods " " 28 " ..	632
	Seed sown at Nafanua and issued as seedlings	3400
	Other varieties	12
	Rooted cuttings issued	71

Revenue from sales of these plants amounted to £64.11.0.

Cocoa Processing:

106. With the completion of the 'Samoan' cocoa drier at Nafanua early in the year, it was possible to process all cocoa beans not required for seed purposes. This drier was operated very successfully and was demonstrated to a large number of visitors.

The total value of beans sold locally and shipped to Messrs Cadbury, Pascall, Fry & Hudson for experimental purposes was £143.14.0.

Cocoa Grading:

107. Laboratory studies on the grading of samples of locally grown cocoa were instituted with valuable results and will be continued as the basis for a report on the average standard of Samoan cocoa from different local sources, as compared with world market requirements as specified by the Cocoa Alliance in a recent publication.

Vegetables and Food Crops:

108. In order to determine overseas market prospects and trends, small plots of Capsicum and eggplants were established and the produce shipped to New Zealand throughout the year. In all 5 cases of capsicum, 92 of eggplants and 125 of pawpaws were shipped, for a total return of £170. Reports on these were regularly received. Other vegetables grown were Cauliflower (Pua-kea), tomatoes, beans and spinach. Seeds of all varieties were selected for distribution to the public.

Areas of Cassava, taro, ta'amu and dasheen, sweet corn, sorghum and pole were maintained for experimental purposes and for distribution of planting material. A report on the dasheen a new crop has been published.

Pastures, Grasses and Legumes:

109. The observation and propagation plots were extended and very considerable quantities of planting material and seeds issued for the establishment of new grazing areas. A valuable collection of grasses (8 species) was received from Fiji.

Details of these and other new introductions are given at Appendix III. The value of improved pastures is well demonstrated by the great improvement in the condition of dairy and beef cattle at Avele College Farm. The principal species distributed were a) Grasses: Batiki blue, Falefa, elephant, guinea, java and coastal Bermuda; b) Legumes: Centrosema, Pueraria, Stylosanthes.

Plant Introductions:

110. During the year 112 parcels of seeds and plants were received and established. These are listed at Appendix III. The most important items were:

Clonal cocoa	- 12 Fiji and I.C.S. Selections.
Breadfruit	- 12 varieties from Samoa and Tokelau Islands
Lucerne	- 3 varieties fron New Zealand
Duruka (Saccharum edule)	5 varieties from Fiji
Pasture grasses	- 8 species from Fiji.

Several consignments of plants and seeds were made to overseas territories and individuals. These comprised manila hemp, Pandanus, palms, legumes and coffee. Local distributions recorded in various sections of this report comprised cocoa seeds, seedlings and rooted cuttings, grasses and legumes, vegetables and ornamentals.

Fish Ponds:

111. The breeding pond at Nafanua has provided large numbers of Tilapia fingerlings for distribution throughout Samoa.

Forestry:

112. The timber tree plantings comprise poumuli, malili and yemane trees, as well as the bamboos, all of which have grown very well.

Equipment:

113. Three copra driers and two cocoa driers are operated for trials and demonstrations. During the year 30,000 coconuts were processed to produce 16,000 pounds of first grade copra, and also 102 sacks of copra were re-dried to produce 12,000 pounds of copra. The following machines have proved useful; kapok gin, coffee pulper, coffee huller, kibbling mill, saw-bench, chaff-cutter, and for spraying and dusting, several types of power and hand machines are used.

Visitors:

114. At Nafanua the number of visitors, other than departmental staff, has greatly increased to a total of 800 during the year; local planters and others 306, students and school pupils 480, and overseas 14. The Members of the Legislative Assembly visited the station at the invitation of the Minister.

Revenue:

115. While the production of revenue is not always an essential part of agricultural experimental work, it is useful to record the increased income received at the stations in 1959. (See Appendix Iv). Sales of produce from Nafanua and Vailima e.g. cocoa seeds, seedlings and beans, bananas and other fruits, vegetables (local and export), other seeds and plants, copra drying and other services, yielded the total sum of £721: the major items being:

Copra drying	44.10.0.
Contract ploughing	36. 0.0.
Seeds	36. 0.0.
Vailima (cocoa)	30. 0.0.
Cocoa p lants and Seeds	47.12.6.
Cocoa beans (export)	143.14.0.
Bananas (export)	98. 0.0.
Fruit & Vegetables (export)	170. 0.0.
" " (local)	104. 0.0.
Firewood	11. 0.0.

In addition, very large quantities of seeds and plants, including pasture grasses and legumes, were issued free of charge to planters, Western Samoa Trust Estates Corporation and to Avele Agricultural College Farm.

116. At Vailima, the Acting Field Assistant was concurrently responsible for the cocoa block and for the Forestry activities in the area.

The cocoa trees are now all in bearing and careful records were maintained especially of the clonal selections made in 1954-55 by Dr H. Smith for resistance to black-pod disease. All pods were harvested for records of tree yields and for examination before being processed. The object of this work is to determine which of these selections are both resistant to disease and also high-yielding. The harvest comprised 3415 pods (1293 from clones) and 384 cuttings of the latter taken for propagation at Nafanua. Isolates from black-pod infested pods were sent to the Senior Pathologist at the W.African Cocoa Research Institute where research is being carried out on the strains of the causal fungus. Other crops included bananas - 1 acre, Guinea and Elephant grass - 2 acres. Revenue from the area was £30.

FALEALILI AGRICULTURAL STATION

117. In the 1958 Development Plan, considerable attention was given to the specifications and estimates for development of this area as the principal centre of agricultural work; but the reduced funds available in 1959 necessitated a limited programme. The report of the controlling officer is summarized as follows.

The district farm at Togitogiga has been maintained with a skelton staff during the year; development has been confined to the Manila hemp area which has been expanded considerably and now covers approximately six acres. Enough stems will be available in 1960 to enable a fibre evaluation and yield per acre assessment to be made.

The Kerevat cocoa is now bearing very well and records are being kept of each tree. It is hoped to extend this block during 1960.

The banana areas are not producing very well as the soils are not suitable; but interesting responses to various fertilizers have been obtained. Revenue from the sale of bananas totalled £198.

Centrosema has been established in the hemp and banana areas and it is hoped that it will cover the ground and suppress weed growth as well as providing nitrogen for the crop.

The compound area has been maintained in good condition. Excellent growth has continued in the timber area, the mahogany especially is in good health and is growing tall and straight.

FIELD ADVISORY SERVICES

General:

118. This division was under the control of the Senior Agricultural Officer (Mr A. Higgins) with 2 Agricultural officers 2 Senior Field Assistants and 18 Field Assistants and two clerical officers. In October Mr V.A.T.Leavasā was appointed Agricultural officer, Savai'i. Owing to the essential priority given to the banana industry, field services were unavoidably curtailed. The principal activities of field officers were:

a) Banana Plantation Inspection, Allocation and Packing Supervision:

As a basis for efficient allocation of banana quotas to 4,600 individual growers, quarterly field inspections were necessary. For the work some 876 man-days were spent, and some officers were engaged for 80 per cent of their time on duties in connection with the banana industry. Special teams were organised to supervise packing in the field during periods when reports from New Zealand were critical of arrival condition of the fruit. All field staff participated in port inspection work at Apia and Savai'i ports;

b) Banana Fertilizer demonstrations and Bonus:

Two pilot areas, each approximately 5 acres, were selected in cooperation with the owners to provide centres of investigation and demonstration of fertilizer treatments. Following this, a start was made with the distribution of free fertilizers under the Bonus scheme approved early in the year - by which all producers are entitled to receive fertilizers at the rate of 3d bonus for each case exported. A great deal of preparation and much detailed explanation has been necessary but todate there has been an increasing demand for fertilizers. In Upolu 28,655 pounds of complete fertilizers has been distributed to 74 growers who have complied with the required standards of weed control and management. Savai'i growers have also requested fertilizers and the distribution will be continued in 1960.

Plantation Services:

119. There is a steady demand for these services designed to encourage more efficient cultural management, pest and disease control to increase production. During 1959, field teams visited 38 plantations, pruned 2,000 cocoa trees, sprayed 1,780 trees and applied fertilizer to 390 trees in demonstrations in all districts. It is recorded that cocoa demonstration work is always appreciated by the Samoan growers and appears to interest them much more than banana pruning and fertilizing demonstrations. The continuance of these services is most important.

Weed Control:

120. Under the Agricultural Officer, Headquarters, the weed control services have been engaged as follows:-

a) Inspection of all land from Mulifanua to Falefa and inland;

b) Controlling noxious weeds on Government land and on private land on payment of estimated cost in advance;

c) Trials and demonstrations on use of chemical weed control.

Noxious Weed Inspection:

121. During the year field work was concentrated on the eradication of the very troublesome weed Vao maligi (Elephantopu spicatus). This involved 6,529 visits, the issue of 1,179 written warning notices and 150 prosecutions.

Unfortunately, this weed has been found to be wide spread in Savai'i where control work must now be arranged.

Control of Weeds:

122. Very useful results were obtained with the use of chemicals to control the more important weeds on approximately 160 acres.

Species	Area (Sq.Chns.)	Chemical	Quantity (Gallon)
Elephant's foot	1,401	M.C.P.4	175
Honolulu Rose	92	2.4-D	11
Giant Mimosa	2	2.4.5-T	¼
Black weed	101½	2.4-D	10
Totals:	1,596½	-	196¼

In addition, an area of 70 acres of heavy Lantana was cleared by mechanical means.

Trials and Demonstrations:

123. Six trials were made to compare the effect of various chemicals on the weeds, Elephantopus, Nutgrass, sensitive plant giant sedge, and weeds of plantations and malae. Demonstration of control measures in various areas covered approximately 35 square chains.

New Problems:

124. While the cooperation of many land holders is quite good, the demand on departmental services is very heavy and beyond present capacity. It would appear necessary to concentrate work on the most troublesome species viz. Elephant's foot, giant mimosa and giant sedge with a view to their total eradication. In addition much attention is necessary to assist landholders to control the other proclaimed weeds viz. Honolulu rose and Lantana.

Giant sedge, now established in Upolu, at present occupies an estimated total area of five acres only and therefore justifies a determined and immediate attempt at total eradication before it spreads widely in the Territory. This plant is now regarded as possibly the worst weed to become established in Pacific territories.

Other Activities:

125. The Division undertook the construction of two banana shelters on the jetties at Sala'ilua and Asau in Savai'i, to protect the packed fruit from exposure; and also was actively concerned with the construction of cocoa and copra driers, the distribution of cocoa seedlings and cuttings and with the development of feeder roads.

BANANA MARKETING

126. Consequent on the retirement in July of the Marketing Officer, these services were re-organised with the Senior Agricultural Officer acting officer in charge, with an Assistant Marketing Officer (Accounts) and an Assistant Marketing Officer (Shipping). Much credit is due to these officers for the efficient handling of the large amount of business arising from the marketing of nearly 786,000 cases of bananas.

Export of Bananas:

127. The number of cases shipped during each month of the year are as follows:-

January	64,235	July	45,514
February	83,669	August	63,320
March	60,365	September	60,822
April	60,302	October	92,340
May	79,499	November	53,504
June	46,257	December	76,123
	Total:		785,950

Finance:

128. The income earned from bananas exported during the year amounted to £903,843 of which the following significant payments were made, besides the various other items of expenditure:

Paid to growers (including bonuses of £39,617)	- £432,592
Paid to Samoan Government (export duty)	- 39,298
Paid to Samoan Government (inspection fees)	- 13,099
Paid to Labourers and staff	- 35,480
Paid to Cartage Contractors	- 80,311

During the year, the amount of £20,000 was added to Banana reserve funds, which now total £85,000 invested in New Zealand Government stock.

Transport:

129. Despite the difficulties resulting from the poor condition of the roads in some areas in Upolu and at Savai'i, the work of the cartage contractors has been under the circumstances, quite good. A problem, however, in sea transport is the lack of sufficient good boats which could cope with the transport of bananas from Savai'i in any kind of weather. Two unfortunate incidents during the year resulted in the loss at sea of shooks and the late delivery to Apia of fruit. All cartage contractors nevertheless have been cooperative.

With the increase of activities at Western Savai'i, a clerk has been transferred to Asau to assist in the shipping and clerical work in that area. The improvement of facilities also at Asau has already begun.

Conclusion:

130. The year ended well with a shipment of 29,409 cases per the "Tarawera" at the end of December, which indicates that large shipment quotas can be met at any time with reasonable intervals between shipments.

FISHERIES SERVICES

131. The Senior Agricultural Officer with one Assistant was responsible for maintenance of a reduced programme of fisheries work which comprised:

a) stocking of most suitable fresh water ponds in Territory with Tilapia fry, then providing breeding stock for further developments;

b) investigation of lobster trapping methods, using six traps of conventional pattern. These were tested with different baits and in different localities with negative results, thus confirming that local crayfish are difficult to trap;

c) preliminary investigation of equipment and methods for marine fisheries investigations.

The programme planned for 1959 was delayed owing to circumstances which prevented the S.P.C. Fisheries Officer from visiting W.Samoa as arranged.

PRODUCE AND PLANT INSPECTION SERVICE

132. The officers responsible for control of these services were the Chief Inspector - Mr V.A.T.Leavasa up to 30th September and to Senior Inspector, Mr Ma'ilo S. for the remainder of the year, assisted by a staff of 17 Produce Inspectors. The record amount of work carried out is summarized in the following paragraphs.

Bananas:

133. Inspectors were engaged on 41 shipments, and operated not only in Apia but also at four shipping points in Savai'i and at country depots where 27 supervisors were employed to check packing and grading of fruit. At the shipping points a

total of 811,177 cases was inspected. Of these, rejects numbered 25,227 (Apia 12,350, Salelologa 1,175, Faganalo 1,059 and W.Savai'i 1,443) - leaving a total of 785,950 for shipment.

In addition 681 cases of bananas, 1,331 sacks and 5 bunches offered for private shipment were inspected. It was necessary to engage additional supervisors for work at packing depots.

Copra:

134. Many visits of inspection and instruction were made to country trading stations and villages and an increased use of hot-air driers resulted in a marked increase of H.A.D. quality copra. In addition to 16,840 tons of copra for export, some 12,280 husked coconuts were inspected. Only 3,027 pounds of substandard copra were condemned.

During the year 72 court prosecutions under the Copra Ordinance yielded £254 in fines; 29 licences for undried copra and 440 copra trading licences were issued, with a total revenue of £365.

Cocoa:

135. There was a slight increase in the quantity of cocoa inspected prior to export - there were 43 prosecutions, with £140 in fines. Inspectors were fully engaged on instructional work in all districts and also carried out regular copra drying trials and observations. The number of cocoa trading licences issued was 394 - revenue £98.10.0.

Other exports:

136. The scope and range of the Division's routine work is indicated by the following lists of produce and livestock inspected prior to shipment to New Zealand and American Samoa.

Exports inspected:

a) to American Samoa:

Bananas	1331 sks.	Yams	12 Bskts.
Ta'amū	1305 "	Pineapples	4 "
Taros	3005 "	Lemons	7 "
Kapok wool	64 "	Pawpaws	2 "
Nuts	54 "	Cucumbers	5 "
Pandanus	6 "	Chocos	1 "
Cocoa Beans	3 "	Nuts in Husks	2000 only
Breadfruits	3 "	Samoan tobacco	2 Sais.
Grapefruits	3 "	Coffee Beans	2 Bags
Straw	1 "	Taro tops	20 "
Mats	52 Bdles.	Mangoes	27 cases
Mattresses	14 "	Avocados	4 "
		Vegetables	69 "
		Pumpkins	2 "
		Oranges	2 "
		Samoan Oil	22 "

b) New Zealand:

Taros	465	c/s	Kapok wool	35	Bags
Bananas	681	"	Broken Nutmegs	1	"
Yams	20	"	Mace	16	"
Solo Pawpaws	43	"	Banana chips	1	"
S/cane	5	"	Nutmegs	33	"
Ta'amu	116	"	Mattresses	31	Bdls.
Pawpaws	1496	"	Hibiscus cuttings	5	"
Capsicum	6	"	Mats	44	"
Wardian	2	"			
Avocados	367	"	Plants	9	pcs.
Samoan Oil	22	"	Cow Hides	239	sks.
Pineapples	40	"	P/seeds	4	lbs.
Coconuts	203	"	Handicrafts	15	sets
Eggplants	103	"	Palusami	5	bskts.
Mangoes	117	"	Bunches Bananas	5	
Manila hemp	2	"			
Granadilla	2	"			
Samoan starch	1	"			
Polynesian Plums	4	"			
Grapefruits	112	"			

Export of Livestock (American Samoa)

Pigs	193
Fowls	259
Ducks	7
Dogs	1

Imports inspected:

137. A summary of inward cargoes by 126 surface vessels and 54 aircraft calling for inspection, fumigation or other treatment is as follows:

25,040 bags (including potatoes, wheat, oats, garlic, roots, onions, rice, chaff, peanuts);

2,717 cases (including fruits, vegetables, plants and seeds);

61 parcels (mats, bedding etc.)
292 livestock (pigs, poultry, cattle, cats and dogs).

All incoming aircraft and surface vessels were met; and the introduction of an air service between Upolu and Tutuila in American Samoa added to the responsibilities of the service. At the latter point valuable assistance was given by the Police officer stationed at Faleolo airport. At Apia, one Inspector was employed almost full time on port quarantine and inspection duties.

Other Activities:

138. The Division was responsible for the conduct of prosecutions in the Court. In addition to the cases referred to above - there were 179 persons charged with offences under the Rhinoceros Beetle Ordinance 1954 and 32 under the Noxious Weeds Ordinance. Fines totalled £335.10.0., and £38.15.0., respectively.

FORESTRY SERVICES

139. Departmental work was continued with one Field Assistant under the supervision of the Agricultural Officer Development until May, and then under the Director. One Field Assistant was granted leave and proceeded to New Zealand. The scope of work was much enlarged by the extension of activities to the Vailima River and Mt. Vaea reserves, and now covers the following areas:-

Alaoa	- mixed exotic	and	indigenous	protection forest
Vailima (La'au)	"	"	"	plantations
Mt Vaea Reserve	"	"	"	forest
Vailima River	"	"	"	protection forest
Aleisa Reserve	indigenous forest.			

In addition blocks of timber trees were maintained at Nafanua and Togitogiga.

140. The Forestry work of the Department in the field comprises limited action along the following lines:

a) Introduction, collection, and propagation of useful timber trees;

b) Distribution of tree seedlings to the public;

c) Planting and maintenance of observation blocks of principal species for observations on rates of growth and suitability for Samoa;

d) Planting of national reserves and water catchment reserves; and

e) Utilization studies including the use and disposal of thinnings from forest plots.

The present note records current work in connection with the planting and silvicultural programme and is based on the reports of the Field Assistant.

Introduction, Collection, and Propagation:

141. During the past year seeds of the following forest species have been collected or introduced for propagation in departmental nurseries (present seedlings stock in brackets):

Indigenous: (a) Trees:

Anume (*Diospyros samoensis*)
Ifiifi (*Parinarium glaberrimum*) - 330
Tava (*Pometia pinnata*)
Ifilele (*Afzelia bijuga*) - 124
Tamanu (*Calophyllum samoense*) - 140
Malili (*Terminalia richii*)
Poumuli (*Securinega samoana*) - 120
Talie (*T. catappa*) - 216
Mamalava.

(b) Palms:

Niuvao (*Clinostigma oncorhyncha*) - 210
Maniuniu (*Balaka*)

Exotic:

Yemane (Gmelina arborea)
(Albizzia falcata) - 340
Niu Masoa (Metroxylon sp.)
Cola (Cola nitida) - 160
Pink Cassia (Cassia grandis- 76

(c) Bamboos:

Ofe Samoa (Schizostachyum glaucifolium)

Distribution during the second quarter included the following: Tava 145, Talie 250, Tamanu 232, Cola 144, poumuli 27, and seeds of indigenous palms and other plants supplied in response to overseas requests.

Forest Planting and Restocking:

142. The Vailima block, known as La'au, now contains the following species planted at various periods during the past seven years.

Exotic Species:

Albizzia	731 trees
Cedrela	1,629 "
Mahogany	1,495 "
Cassia siamea	62 "
Yemane	246 "

Indigenous:

Ifiifi	830	Talie	830
Ifilele	830	Poumuli	607
Tava	830	Tamanu	152

Approximate area planted, 13 acres (total 8,242 trees).

The Nafanua stream-bank planting comprises, poumuli 1,720 trees, Yemane 50 trees, Tamanu 6 trees, and Malili 6 trees. Also as a section of the forestry programme six species of bamboo are well established here as recorded in Vol.3 No.2 of the "Laufasi Ola".

During 1958 the Department commenced planting up the stream bank reserves on the upper branches of the Vailima river near the foot of Mt Vaea; and continued with the planting of the Alaoa reserve.

The Vaea reserve (upper Vailima) has been planted with 546 poumuli, 355 tava, 108 teak, and 144 cola. This project involves the planting up of vacant areas in natural protection forest on steep banks of three branch streams of the Vailima River.

In the grounds of Government House, as a result of the active interest of the High Commissioner, 1,750 poumuli and 1,250 Mahogany trees have been established. Teak 108, tava 355, poumuli 546, and Cola 144; total 1,153 trees; approximate area 1.8 acres.

At the Alaoa reserve additional poumuli have recently been planted - this area now comprises well established plantings of the following species - Cedrela 378, Mahogany 56, Albizzia 804, and poumuli 350, total 1,668 trees; approximate area 2.6 acres completed.

Thinning and Utilization:

143. During May and June this year thinning operations were carried out in Albizzia and Cedrela stands at Vailima and Nafanua where the oldest trees are now approximately seven years old. The original spacing of 8 ft. x 8 ft. had called for some thinning during 1958 when up to 20 per cent of the Cedrela poles were removed from the plots.

These thinnings comprised:

Albizzia: 281 trees yielded 311 logs, over 6 in. diameter, delivered to sawmill; and a large quantity of fence posts and firewood.

Cedrela: 326 posts, each 6 ft. long, were used for fence posts.

Useable logs extracted during these operations varied in diameter from 7 in. to 16 in., and in length from 8 ft. to 18 ft. and contained approximately 6,000 super feet.

The timber was sawn into sizes suitable for departmental use for cases in the experimental shipment of fruit and vegetables; and some was used for farm construction purposes.

One Samanea tree, felled in the course of agricultural work, yielded approximately 335 super feet in ten logs with an average diameter of 13 in. This timber, which is dark with well-marked grain, is in demand in Hawaii for the manufacture of trays, bowls, and other articles for the tourist trade.

During the term holidays students of the Avele Agricultural College were employed in the various forestry activities and took a keen interest in the problems involved and the method employed.

With the assistance of the staff Surveyor, Lands Department, the boundaries of the Mt Vaea reserve were located and a start made with the Planting of shelter belts of distinctive trees.

Large numbers of timber trees seedlings were propagated for planting during the summer rains and for distribution. The growth of species as poumuli, yemane, Cedrela and mahogany was exceptionally good.

Two reports on forestry work were published in Laufasi Ola (5).

PEST CONTROL, PLANT QUARANTINE AND ENTOMOLOGY SERVICES

144. Under the direction of the Entomologist (Mr P.S.Dale), supported by two Laboratory Assistants, outstanding progress has been made both in the field and laboratory. Some of the most important work undertaken included:-

a) expansion of rhinoceros beetle control work to all districts;

b) vigorous and successful field campaign to eradicate banana virus disease;

A small outbreak of the disease in Sapapali'i, Savai'i was reported in October and was eradicated a week later. The disease has also been found in most parts of Apia, and from Vaiusu to Luatuanu'u; but the numbers are small and, after the destruction of about 3,000 plants (mainly around Lalovaea), the area is almost clean.

For 1960, the areas around Tanumapua, Alcisa, Lepalc, Leauva'a and Falcula remain to be treated as well as the remaining part of Falelatai. Great credit is due to the Senior Field Supervisor for this remarkable progress. His organisation and supervision of field teams and his real interest in the success of the project have made this achievement possible. The sub-foremen and the Field Assistants also deserve commendation.

Banana Stem Weevil:

150. The beneficial predator (Placsius) introduced in November 1957 for the control of the stem weevil, was recorded at Avele on October 5. It had already been recorded from Solosolo and Falelatai where it was released last year; but this is the first record of Placsius away from these places, and a good indication of its establishment in Samoa.

Coffee root fungus:

151. A trial at Lepale for control of cicada nymphs, using Aldrin, Vapam and formalin .5%, gave a fair response to formalin, and no response to Aldrin, suggesting that the fungus was the cause of the trouble, rather than the cicada nymphs. The Vapam treated sites have not yet been replanted.

Cocoa Bagmoth:

152. This pest was treated at Lefaga and a study made of its parasites. There has been no further trouble at Leauva'a with this pest which is controlled by the parasitic fly Tachina psychidarum, an insect not previously recorded in Samoa.

Cocoa Longhorn Borer; continues to cause damage to bark and branches, particularly in old and neglected plantations. A trial using "Dieldrin Special" was made at Tanumapua in November; but it is as yet too early to assess its effectiveness.

New Citrus Moth:

153. An unidentified Arctiid moth has been observed causing slight damage to the leaves of citrus plants at Fasito'otai and at Sataua, Savai'i.

154. Taro Pests have caused little damage this year. One outbreak of Gaogao was treated in the first quarter and two others in the fourth quarter. There has been no serious Prodenia damage reported during the year.

155. Armyworm occurred on pasture at Solaua in the second quarter but there have been no other outbreaks during the year. The damage was extensive but was reported too late for treatment.

Garden Pests:

156. Plutella on cabbages, root fungus on tomatoes and Rose beetle on hibiscus and other plants were treated successfully.

New Equipment:

157. The section is now equipped to deal with all ordinary pest control problems.

Plastic fumigation sheets enable the fumigation of material which cannot or should not be taken to the fumigator. The ethylene-dichloride fumigant used on such work is quite safe to use though it is rather more expensive than the methyl-bromide used in the fumigation chamber.

A "Solo" motor driven sprayer and duster can handle all spraying and dusting problems, including spraying of warehouses. As a duster it can cover more than five acres of taro per day.

For small jobs where heavy equipment is not necessary, the section has an "Arimitsu" knapsack sprayer and an "Arimitsu" rotary duster both of which have proved efficient.

A large number of very effective simple and cheap hand bellows for dusting crops with insecticides were made by the Department from a design drawn up by a United States agency operating in Indonesia. These machines, costing only a few shillings each, are made of local waste materials; and many of them were used in the field work on banana bunchytop virus to destroy the insect vectors. They also proved very useful for dusting taro and other crops infested with gaogao and anufe (caterpillars). A full description was published in Laufasi Ola (7).

Fumigation & Quarantine Services:

158. The Laboratory Assistant (Mr Tua'i) reports as follows: The two fumigators at Nafanua have been in steady operation from January to December 1959. Following are the quantity of material fumigated and amounts received in fees.

Atmospheric fumigator:

Plant material	6 tons		
Cocoa nibs	46 "	16 sacks	
Cocoa shells	184 "		
	232 tons	- 16 sacks	= £89. 6.6.
Citrus Fruits	330 cases		7.10.0.
Thatches	10 bundles		2.10.0.
			Total:£99. 6.6.

Vacuum fumigator:

Kava roots	66 bundles	
Oranges	75 cartons	
Kapok	7 bundles	
Melons	37	
Mats	15 "	
		Total:£26. 0. 0.

Local merchants and general public are becoming more informed of the regulations as shown by the ready response to declare all cocoa nibs, cocoa shells, plants, fruits etc., for fumigation, prior to shipment or on arrival in Apia. The trade between Apia and Pago Pago, Tonga, New Zealand in kava roots and fruits presents an almost continual flow of work for the fumigator. A considerable proportion of the total revenue was derived from this.

159. Fumigation services have been much in demand this year. Operation and records have been very capably handled by the Laboratory Assistant. Fees totalling £125 were received.

Overseas aircraft importations have been inspected by the Laboratory Assistant and those by Samoan Airlines have been ably inspected by the Police. Tomatoes from Cook Islands and Kava from Tutuila are the only items which often arrive without certificates.

The Entomologist made several broadcasts and contributed a number of reports and articles for publication in "Laufasi Ola" (8). He prepared the text of an illustrated bulletin on the Insect Pests of W.Samoa and their control.

B.E.V. PARHAM
DIRECTOR OF AGRICULTURE
31/1/60.

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APPENDICES

I Meteorological Data - 1959

II Cash and Food Crop Production - 1959

III Plant Introductions - 1959

IV Departmental Revenue - 1959

V 'Laufasi Ola' - Vol.4 - Contents.

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APPENDIX I

METEOROLOGICAL DATA, 1959*

Month	Rainfall	Mean Temp.	Mean Max Temp.	Mean Min. Temp.	Sunshin
January	11.86	80.72	86.6	74.9	186.8
February	18.58	81.31	86.7	76.3	164.5
March	11.72	81.12	87.3	75.4	209.6
April	6.09	81.65	88.0	75.6	231.5
May	5.49	81.65	87.6	75.3	241.5
June	1.01	80.18	86.6	74.1	227.9
July	4.04	79.35	86.1	71.9	248.2
August	2.79	79.49	85.5	73.4	222.1
September	6.80	79.19	85.4	73.0	249.3
October	14.79	79.97	85.6	74.8	189.8
November	14.53	79.82	86.1	74.3	206.5
December	26.46	79.88	85.5	74.7	142.0
Year	124.16	80.36	86.4	74.5	2519.7

Rainfall: Departure from normal +12.05; Greatest Daily fall 6.41" on 24th December.

Sunshine: Departure from normal -28.3 hours.

Wind Speed: Mean speed 5.4 knots; Departure from normal -0.6 knots. Highest gust 42 knots from Northwest on 14th February.

Relative Humidity: Mean 83.7%; Departure from normal +0.6%.

*By courtesy, Officer-in-Charge, Meteorological Office, Apia.

APPENDIX II

AGRICULTURAL PRODUCTION 1959

PRODUCTION OF CASH CROPS

DESCRIPTION AND UNIT	A. EXPORT		B. LOCAL - Estd.		C. TOTALS		REMARKS
	Quantity	Value £	Quantity	Value £	Quantity	Value £	
Bananas - Cases a)	785,950	903,842			785,950	993,642	a) Contract market in N.Z. 23/- per case fob Apia.
" " b)	3,343	3,844			3,343	3,844	b) Private consignments to N.Z. and Am. Samoa.
" " c)	-	-	25,227	2,522	25,227	2,522	c) Reject & surplus fruit sold in Apia at 2/- per case
" " d)	-	-	300,000	30,000	300,000	30,000	d) Estimated domestic consumption valued at 2/- per case
	789,293	907,684	325,227	32,522	1114,520	1030,008	
Cocoa Tons a)	2654						a) First grade
b)	1164						b) Second grade
c)	192						c) Domestic consumption estimated valued at £150 per ton.
d)	179	-	60	9,000			
	4189	969,860	60	9,000	4,249	970,760	
Copra - Tons a)	8442						a) H.A.D.
b)	4890						b) Samoa Quality - S.D.1.
c)	3508						c) S.D.2.
	15840	1400,000	5,000	400,000	17,340	1800,000	
Taro - cwt.	7000	10,500	35,000	52,500	42,000	63,000	Average price 3d per lb. Exported to N.Z. and Am. Samoa. Sold locally and used for home consumption.
Ta'amu "			22,000	33,000	22,000	33,000	
Yams & other roots	30	60	1,000	2,000	1,030	2,060	
	7030	10,560	58,000	87,500	5,030	98,060	

DESCRIPTION AND UNIT	A. EXPORT		B. LOCAL (Estd)		C. TOTALS		REMARKS
	Quantity	Value £.	Quantity	Value £.	Quantity	Value £.	
Fruit – Cases							
Citrus	114	250	3,000	1,000	1,114	1,250	Exported to N.Z. and Am.Samoa
Mangoes	144	150	4,000	2,000	4,144	2,150	Sold locally or used for home consumption. Estimated only.
Avocado	370	750	500	800	870	1,550	
Pawpaw	1,539	800	5,000	1,000	1,539	1,800	Local consumption of coconuts recorded under Copra (above)
Pineapples	96	100	2,000	2,400	2,096	2,500	
Other	80	120	300	150	380	270	
Coconuts	520	120	–	–	–	–	
	2,863	2,290	14,800	7,350	19,663	9,640	
Coffee – Cwt.	100	2,000	1,100	2,200	1,200	2,400	Production estimated, very little export in 1959.
Kapok – Lbs.	1,000	100	12,000	600	13,000	700	Used for domestic purposes.
Nutmegs – "	5,000	2,000	2,000	500	7,000	2,500	Export increasing.
Oil – Cases	22	15	..	..	..	15	
Breadfruit – Tons	–	–	8,000	16,000	8,000	16,000	Local production probably under estimated.
Beef – Fresh – lbs.	–	–	1050,000	65,000	1050,000	165,500	" " " " "
Hides	1,507	3,000	–	–	1,507	3,000	Export production only.
Milk – (gallons)	–	–	28,000	5,600	28,000	5,600	Local export production only.
Vegetables – cases	190	200	2,000	2,000			" " " "
Miscellaneous	–	–	..	8,000	–	–	" " " "
	–	7,315	–	106,100	–	119,515	

APPENDIX III

PLANT INTRODUCTIONS - 1959

The following is a list of 112 parcels of seeds, plants and cuttings introduced from overseas or collected from local sources within the Territory and registered at Nafanua for study, propagation and later distribution. The first column gives the W.Samoan Department of Agriculture number; the second, the scientific name and family with notes on uses; and the third, the common name where known:

WSDA No.	DESCRIPTION		COMMON NAME
4781 to 4782	From FIJI, Department of Agriculture Seeds, received 1-1-59.		
	Oryza sativa L. 4781 var. BANDALA 4782 var. SERENDAH KURUNG For previous introduction see WSDA No.4745.	Gramineae	RICE
4783	From QUEENSLAND, Department of Agriculture. Seeds received 27-1-59.		
	Stylosanthes sundaica Taub A useful pasture plant with low, spreading habit. First introduction to W.Samoa.	Leguminosae	TOWNSVILLE LUCERNE
4784	From TRINIDAD, Imperial College of Tropical Agriculture. Seeds received 5-3-59.		
	Ischnosiphon arouma Herbaceous plant used for making baskets for plant propagation purposes. First introduction.		TIRITE ~~AROUMA~~
4785 to 4790	From FIJI, Department of Agriculture Seeds and plants received 5-3-59.		
	4785 Coffea canephora For previous introduction see No.4735.	Rubiaceae	COFFEE
	4786 Piper nigrum L. For previous introduction see No.4750.	Piperaceae	BLACK PEPPER
	4787-9 Theobroma cacao L. Rooted cuttings. 4787 var. S1070 (R4T3A) - Fiji amelonado 4788 " I.C.S.1 - Trinitario 4789 " I.C.S.60 - " For previous introduction see No.4658.	Sterculiaceae	COCOA
	4790 Xanthosoma brasiliensis First introduction - useful spinach plant.	Araceae	
4791 to 4793	From NEW ZEALAND, seeds purchased from P.G.Ellis & Co.Christchurch, received 5-3-59.		
	Medicago sativa L. 4791 var. Marlborough 4792 " Hunter River 4793 " Italian Valuable fodder plant for Avele Agricultural College farm. For previous introduction see No.4696.	Leguminosae	LUCERNE

WASDA No.	DESCRIPTION		COMMON NAME
4794	From TRINIDAD, Imperial College of Tropical Agriculture. Seeds received 9-4-59.		
	Ischnosiphon arouma	Marantaceae	TIRITE AROUMA
	For previous introduction see No.4784.		
4795 to 4800	From W.SAMOA, plants collected by Dept. of Agriculture. Field staff received 11-5-59.		
	Artocarpus incisus (Thunb)L.F.,	Moraceae	BREADFRUIT
	4795 - var. AVELOLOA		
	4796 - " MA'AFALA		
	4797 - " MAOPO		
	4798 - " MOAMOA LEGA		
	4799 - " PUOU		
	4800 - " ULUEA		
	For previous introduction see No.4617.		
4801 to 4803	From W.SAMOA, Upolu, plants collected by field staff received 11-5-59.		
	Colocasia esculenta (L) Schott,	Araceae	TARO
	4801 - var. MANINI		
	4802 - " NIUE		
	4803 - " TUSITUSI		
	For previous introduction see No.4765.		
4804	From W.SAMOA, Upolu, plants collected by field staff and received 13-5-59.		
	Artocarpus incisus (Thunb.) L.f., var. FATULASI.	Moraceae	BREADFRUIT
	For previous introduction see No.4800.		
4805	From W.SAMOA, Upolu - 180 plants collected by field staff, received 13-5-59.		
	Ananas comosus (L) Merr.	Bromeliaceae	PINEAPPLE
4806 to 4807	From W.SAMOA, Upolu, plants received from J.Schwalger on 14-5-59.		
	4806 Ananas comosus (L) Merr.	Bromeliaceae	PINEAPPLE
	4807 do do	do	"
	For previous record see No.4805.		
4808	From W.SAMOA, Lana, Upolu. Seeds collected B.E.V.P. received 27-5-59.		
	Calophyllum samoense, Christoph.,	Guttiferae	TAMANU
	Large forest tree, for previous record see No.4650.		
4809 to 4818	From FIJI, Naduruloulou. Plants donated by Dept. of Agriculture received by surface vessel 28-5-59.		
	4809 Congea velutina Wight,	Verbenaceae	CONGEA
	Climbing shrub from Malaya, with panicles of flowers, bracts lilac coloured.		

WSDA No.	DESCRIPTION		COMMON NAME
	4810-4818 Theobroma cacao L., Clonal cuttings rooted, as follows:-	Sterculiaceae	COCOA
	4810 - var. G.S.29 4811 - " G.S.36 4812 - " I.C.S.60 4813 - " I.C.S.89 4814 - " I.C.S.95 4815 - " I.C.S.98 4816 - " N.A.32 4817 - " P.A.35 4818 - " S.535 For previous record see No.4789.		
4819	From TONGA, seeds received 28-5-59. Citrus nobilis Lour. For previous record see No.4612.	Rutaceae	MANDARIN ORANGE
4820 to 4821	From W.SAMOA, Lana, Upolu, seeds collected B.E.V.P. received 4-6-59.		
	4820 Coffea ?arabica X A hybrid coffee with heavy crop. For previous records see No.4732.		
	4821 Garcinia xanthochymus Hook.f. Ornamental medium sized tree, with string leathery leaves, fruit yellow, edible, sour.	Guttiferae	GOURKA
4825	From NEW CALEDONIA, seeds collected by Miss E.Bastide received 8-7-59. Sesbania grandiflora (L) Pers. Red flowered variety. For previous introduction see No.4521.	Leguminosae	SESBAN
4826 to 4831	From FIJI, Naduruloulou, cuttings donated by Dept. of Agriculture, received per B.E.V.P. 8-7-59.		
	4826 Tripsacum laxum Nash First introduction of this large fodder grass, originally from Trinidad 1946.		GUATEMALA GRASS
	4827-4831 Saccharum edule L. Cane grass with edible inflorescences-aboriginal introduction or indigenous in Fiji. Five varieties collected F.V.Raigiso, Nadaro, Verata, Tailevu Province.	Gramineae	FIJI ASPARAGUS
	4827 - var. DURUKA WA (Vico) 4828 - " DABANI DURUKA BALAVU 4829 - " DURUKA MIMANU DAMU 4830 - " DABANI DURUKA LEKA (i) 4831 - " DABANI DURUKA LEKA (ii) For previous record see No.4472.		

WSDA No.	DESCRIPTION		COMMON NAME
4832	From NEW ZEALAND, seeds forwarded by J.C.Gerlach Esq., N.Z.Dept. of Agriculture, received 24-7-59.		
	Gleditsia triacanthos First introduction of this leguminous tree which bears sugary pods, useful as cattle fodder.	Leguminosae	SWEET LOCUS
4833 to 4834	From W.SAMOA, Mt Tofua and Lana, Upolu. Plants and seeds collected B.E.V.P. received July 1959.		
	4833 - Musa paradisiaca spp sapientum (L) O.Ktze., var. Grosmichel	Musaceae	BANANA
	4834 - Musa banksii Indigenous banana.	Musaceae	TAEMANU
4835 to 4837	From NEW CALEDONIA, seeds collected B.E.V.P. received 26-7-59.		
	4835 - Nerium oleander L., Ornamental shrub from garden of H.Van Pel Esq., Noumea - flowers pale pink.	Apocynaceae	OLEANDER
	4836 - Tephrosia purpurea (L) Pers. Perennial, low shrub - for cover crop, from hills behind Noumea.	Leguminosae	AVA SA
	4837 - Serianthes calycina Benth. Large timber tree from ridge forest.		
4838	From FIJI, King's Road near Tavua, seeds collected B.E.V.P. received 8-7-59.		
	Moringa oleifera Lam. Tree with alternate fern-like leaves and panicles of white flowers; narrow 3-6 angled pods. Leaves for cattle fodder, seeds for ben oil.	Moringaceae	HORSE RADDI TREE
4839	From FIJI, seeds donated by H.W.Simmonds Esq., O.B.E. received 8-7-59.		
	Lycopersicon esculentum Mill. var. MANALUCIE from Florida. Previous record see No.4776.	Solanaceae	TOMATO
4840	From TAHITI, Dept. of Agriculture, two plants donated by M.Millard, received by TEAL aircraft 27-7-59.		
	Citrus grandis (=C.decumana) var. SARAWAK. Grapefruit or pomelo noted for prolific fruiting habit.		PAMPLE MOUS
4841 to 4842	From W.SAMOA, Upolu, seeds and plants collected by J.Schwalger, Dept. of Agriculture, received 10-8-59.		
	4841 - Metroxylon sp. Seeds of sago palm, called NIU MASOA. See previous record, No.4775.	Palmae	SAGO PALM
	4842 - Schizostachycum sp. Roots of indigenous bamboo from Togitogiga.		BAMBOO

WSDA No.	DESCRIPTION		COMMON NAME
4843	From W.SAMOA, Upolu, cuttings donated by Mrs Bairstow, Apia, received 11-8-59.		
	Solandra guttata Don. Woody liane with large yellow gold brown streaked flowers.	Solanaceae	CUP OF GOLD
4844	From QUEENSLAND, Dept. of Agriculture seeds received late 1958 and recorded 11 August 1959.		
	Stylosanthes gracilis H.B+K	Leguminosae	PENCIL FLOWER
	For previous record, see No.4772		
4845 to 4848	From W.SAMOA, Upolu, seeds and plants collected B.E.V.P. in localities listed, received 8-9-59.		
	4845 - Schizostachyum sp. See No.4842	Gramineae	BAMBOO or OFE SAMOA
	4846 - Phaseolus adenanthus, Meyer,	Leguminosae	
	4847 - Cordia subcordata Lam., Spreading tree indigenous but uncommon in Samoa in coastal areas - known as TAUANAVE timber valuable for canoe-building.	Boraginaceae	TAUANAVE
	4848 - Phyllanthus acidus (L) Skeels Seedlings collected at Saleimoa. Tree with white fruits, edible, Samoan name VINI.	Euphorbiaceae	OTAHEITE GOOSEBERRY
4849 to 4854	From SINGAPORE, Royal Botanic Gardens, seeds donated by Director received 8-9-59.		
	4849 - Cassia javanica L.s. fistula L.,	Leguminosae	RAINBOW SHOWER
	4850 - Cassia multijuga Rich. For previous record see No.4553.	do	TIMOR SHOWER
	4851 - Cassia suratensis Burm F. First introduction.	Leguminosae	
	4852 - Hibiscus mutabilis L. Ornamental shrub with large flowers.	Malvaceae	COTTON ROSE
	4853 - Portlandia grandiflora Ornamental shrub, first introduction.		
	4854 - Stenolobium stans (L) Don. Ornamental shrub, useful as support for Vanilla vine. First accession.	Bignoniaceae	YELLOW ELDER
4855	From W.SAMOA, Upolu, seeds collected by field officer Leota Seiuli at Ma'alauli, received 8-9-59.		
	Lagenaria sicerana (Molina) Standl. Large creeping vine with bottle shaped fruits, edible when young. First introduction.		BOTTLE GOURD
4856	From W.SAMOA, Upolu, cuttings donated by Mrs E.F.Paul, Vailima, received 8-9-59.		
	Stenolobium stans (L) Don. For previous record, see No.4854.	Bignoniaceae	YELLOW ELDER

WSDA No.	DESCRIPTION		COMMON NAME
4857	From TONGA, seedlings donated by E. Lawrence Esq., O.B.E. Director of Agriculture, received 20-9-59. Santalum yasi, Seem. Small tree with light foliage, Heartwood perfumed and durable, used for scenting coconut oil. First introduction.	Santalaceae	SANDAL WOOD
4858	From W.SAMOA, Upolu, seeds collected at Apia and received 20-9-59. Stenolobium stans (L) Don., See record No.4856.	Bignoniaceae	YELLOW ELDER
4859	From W.SAMOA, Upolu, seeds collected J.Schwalger at Saleimoa received 23-9-59. Cordia subcordata Lam. For previous record see No.4847.	Boraginaceae	TAUGAVE
4860	From FIJI, seeds donated Conservator of Forests, received 23-9-59. Swietenia macrophylla King, For previous introduction see No.4639.	Meliaceae	MAHOGANY
4861	From W.SAMOA, Upolu, seeds donated by Mr A.Lambourne, Apia received 23-9-59. Capsicum frutescens L. var. cerasiforme. Shrub with round berries, red when ripe.	Solanaceae	CHERRY PEPPER
4862 to 4871	From FIJI, Naduruloulou, seeds and plants of pasture grass donated by Botanist, Dept. of Agriculture, received 8-10-59.		
	4862 - Bothriochloa intermedia (R.Br.) A. Camms. Useful pasture grass for dry areas.	Gramineae	LAUTOKA GRASS
	4863 - Chloris gayana Kunth,	Gramineae	RHODES GRASS
	4864 - Dichanthium annulatum (Forsk) Stapf.	"	
	4865 - Pennisetum ciliare (L) Link, A good pasture grass for dry areas.	"	BUFFEL GRASS
	4866 - Brachiaria brizantha (Hochst.)	FDA 15072	SIGNAL GRASS
	4867 - do	FDA 15072	" "
	4868 - do	FDA 15073	" "
	4869 - Setaria spacelata		
	4870 -		PANGOLA GRASS
	4871 - Paspalum scrobiculatum L. An erect dark brown grass, with 2 erect racemes.	Gramineae	
4872	From FIJI, Dept. of Agriculture, seeds sent by Botanist, received 2-11-59. Ixophorus linisetus	Bramineae	
4873- 4879	From TOKELAU ISLANDS, seeds and plants collected B.E.V.P. received 11-11-59.		
	4873 - Artocarpus incisus (Thunb)L.f. From Nukunono Atoll.	Moraceae	ULU ELISE
	4874 - do from Atafu Atoll. For previous introduction see No.4804.		
	4875 - Pandanus ?cylindricus Kanehira, From Atafu.	Pandanaceae	LAUFALA ELISE

WSDA No.	DESCRIPTION		COMMON NAME
4876	- Pandanus sp. from Atafu	Pandanaceae	LAUFALA VAO
4877	- Pandanus sp. from Nukunono	"	do
4878	- Pandanus ?cylindricus, Kanehira From Nukunono. The above species and varieties of Pandanus are an important element in the vegetation of these islets and provide building material, thatch, mats etc.	"	LAUFALA ELISE
4879	- Crinum asiaticum L. A red variety grown at Nukunono. Leaf bases used as fish lure.	Amaryllidaceae	LAUTALOTALO
4880-1	From W.SAMOA, Upolu, plants collected by staff for experimental cultivation in Fiji and here, received 9-11-59.		
4880	- Pandanus upoluensis Martilli,	Pandanceae	LAUFALA
4881	- Pandanus odoratissimus var. savai'iensis Mart. These two species are common in Samoa are used for mats.	"	LAU 'IE
4882 4892	From W.SAMOA, Apolima, seeds and plants collected B.E.V.P. received 20-11-59.		
4882	- Gossypium ?taitense, A small shrub growing on bare rocky ridge at Leaga - flowers not seen but both less than ½" long - fibre pale brown. First record of this indigenous cotton.	Malvaceae	WILD COTTON
4883	- Evodia hortensis Forst., Aromatic shrub, leaves used to perfume coconut oil - not common in Samoa.	Rutaceae	USI
4884	- Coleus sp. Small shrub - leaves used for soap to wash delicate materials.	Labiatae	LAU TĀ'IE
4885	- Bothriochloa ?intermedia (R.Br.) A. Camus, First record of this grass in Samoa. Plants growing on hill-top near light-house, above Apolima village.	Gramineae	LAUTOKA GRASS
4886	- Uraria lagopoides (L) Desv. Leguminous herb - prostrate in grassy areas.	Leguminosae	
4887	- Miscanthus japonicus (Thunb) Tall reed grass, valuable for house building uses, not common in Samoa.	Gramineae	Ū, REED GRASS
4888	- Xanthosoma ?atrovirens C.Koch and Bouche. A very handsome purple red variety of this useful root crop.	Araceae	TALO PALAGI
4889	- Gossypium ?taitense, See No.4882, Plants from another locality.	Malvaceae	
4890	- Cordia subcordata Lam., Tree rare on Apolima from high ridge. For previous record see No.4859.	Boraginaceae	TAUANAVE
4891	- Dioscorea bulbifera L, Liane, with acrid tubers, edible when prepared.	Dioscoreaceae	UFI SOI, Wild Yam
4892	- Phaseolus adenanthus Meyer,	Leguminosae	
4893	From AUSTRALIA, seeds donated by Mrs G.J.Miedecke, received 12-12-59. Macadamia ternifolia Small tree with serrated leaves producing edible nuts of good quality.	Proteaceae	QUEENSLAND NUT

APPENDIX IV

STATEMENT OF REVENUE RECEIVED DURING 1959

Sales of Produce, Seed and Plants:		
Nafanua/Vailima	£569	
Togitogiga	189	
Avele	40	798.0.0.
Sales of Chemicals etc.:		
Laboratory	5	
Insecticides etc.	379	
Fertilizers	51	
Pruning tools	30	465.0.0.
Fees:		
Fumigation	125	
Tractor ploughing	36	
Spraying services	19	180.0.0.
Inspection Fees:		
Bananas	13,099	
Cocoa (4023+)	1,006	
Copra (16,342+)	4,086	18,191.0.0.
Court Fines:		
Cocoa	140	
Copra	254	
Noxious Weeds	39	
Rhinoceros Beetle	336	769.0.0.
		£20,792.0.0.

APPENDIX V

"LAUFASI OLA"

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